

ENVIRONMENTAL TOBACCO SMOKE
(Part 2)

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Environmental Tobacco Smoke, (Part...

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BEFORE THE

SUBCOMMITTEE ON
HEALTH AND THE ENVIRONMENT
OF THE

COMMITTEE ON
ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

ON

H.R. 3434

A BILL TO AMEND THE PUBLIC HEALTH SERVICE ACT TO PROTECT
THE PUBLIC FROM HEALTH HAZARDS CAUSED BY EXPOSURE TO EN-
VIRONMENTAL TOBACCO SMOKE

FEBRUARY 7 and MARCH 17, 1994

Serial No. 103-127

Printed for the use of the Committee on Energy and Commerce

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U.S. HOUSE OF REPRESENTATIVES
OFFICE OF THE CLERK





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ENVIRONMENTAL TOBACCO SMOKE

MONDAY, FEBRUARY 7, 1994

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:15 a.m., in room 2123, Rayburn House Office Building, Hon. Henry A. Waxman (chairman) presiding.

Mr. WAXMAN. Good morning. The subcommittee will please come to order.

We want to welcome everybody to this hearing on environmental tobacco smoke and the Smoke Free Environment Act, H.R. 3434.

This is a historic hearing. This hearing is the first time that any administration—Democrat or Republican—has supported comprehensive nationwide restrictions on smoking. This hearing is the first time that six Surgeons General have appeared together before Congress on any issue. The Surgeons General present today represent 25 years of unbroken service to the last six administrations. They are here at this unprecedented hearing for only one purpose: to stop the devastating health impacts caused by exposure to environmental tobacco smoke.

And, I believe, this hearing marks a turning point. The national mood has changed. While the tobacco industry remains a formidable force, the American public has awakened to the dangers of environmental tobacco smoke and is demanding tough Federal action.

The administration has heard the public's message. Today, EPA administrator Carol Browner will support the Smoke-Free Environment Act. This far-reaching and long overdue legislation implements policy recommendations made by the Administrator at a subcommittee hearing last July. It guarantees all Americans protection from involuntary exposure to tobacco smoke.

Will we in Congress get the message, too? Some people say that Congress can't pass the Smoke Free Environment Act—that special interests, especially the tobacco companies, have too much power here.

I disagree. Those of us fighting for smoke-free environments have an overwhelming advantage over the tobacco companies. We are armed with sound science, inexpensive solutions, and the knowledge that millions of kids too young to fight for themselves are counting on us.

The American people will no longer be fooled by the lies and distortions of the tobacco industry. The indisputable fact is, the health of nonsmokers, especially children, is severely jeopardized by expo-

sure to environmental tobacco smoke. No tobacco industry campaign of misinformation will lessen the determination of parents to protect their children from exposure to the Nation's most widespread class A carcinogen—environmental tobacco smoke.

Those of us in the audience today—especially the members of the news media—have a special responsibility. The tobacco companies thrive in darkness. No Members of Congress can justify a vote against the Smoke-Free Environment Act on policy grounds. Expose what we are doing to the American public, hold each of us accountable—and this bill will become law this year.

At my request, Administrator Browner is preparing a cost-benefit analysis of the Smoke-Free Environment Act. The preliminary findings are now in. And they are compelling.

Compliance with H.R. 3434 will cost less than \$1 billion a year. For this investment, each year the Nation will save over \$100 billion, including \$5 to \$10 billion in the costs of building maintenance; \$6.5 to \$19 billion in medical costs and reductions in lost earnings; and 38,000 to 108,000 lives.

I want to repeat this last point again. Enactment of H.R. 3434 would save the lives of 38,000 to 108,000 Americans each year. The economic value of these lives saved is conservatively estimated to be \$177 to \$513 billion by EPA.

I don't look at this issue as an economist, however; I look at it as a parent. When I think about environmental tobacco smoke, I see the faces of children like 5-year-old Max Graham and 9-year-old Michelle Dart. Just 6 months ago these brave children told the subcommittee how exposure to the smoke from even a single cigarette can trigger an asthma attack.

In Michelle's words, "I get dizzy, I start to sneeze, I can't breathe very well, and sometimes I get too much smoke in my lungs and go into the hospital."

No air pollutant—especially one that is so easily prevented—should ever be allowed to cause so much harm to an innocent child.

Whether you look at this issue through the compassionate eyes of a parent or through the green eye shades of an economist, the conclusion is the same. It is wrong—morally and economically—to expose anyone, especially children, to the hazards of tobacco smoke. Each of us deserves the right to a healthy and smoke-free environment.

We look forward to hearing the testimony of our witnesses. But before calling on them, I want to recognize members of the subcommittee, and first the distinguished Ranking Republican Member, Mr. Bliley.

[The text of H.R. 3434 follows:]

103D CONGRESS
2D SESSION

H. R. 3434

To amend the Public Health Service Act to protect the public from health hazards caused by exposure to environmental tobacco smoke, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 3, 1993

Mr. WAXMAN (for himself, Mr. HANSEN, Mr. BARRETT of Wisconsin, Mr. BEILENSEN, Mr. BROWN of Ohio, Mr. BRYANT, Mrs. COLLINS of Illinois, Mr. DELLUMS, Mr. DURBIN, Mr. FARR of California, Mr. FOGLIETTA, Ms. FURSE, Mr. HUFFINGTON, Mr. JOHNSTON of Florida, Mr. KREIDLER, Mr. LaFALCE, Mr. LEWIS of Georgia, Ms. MARGOLIES-MEZVINSKY, Mr. MARKEY, Mr. MAZZOLI, Mr. McDERMOTT, Ms. MCKINNEY, Mr. MEEHAN, Mr. MILLER of California, Mr. OBERSTAR, Ms. PELOSI, Mr. RICHARDSON, Ms. SCHENK, Mrs. SCHROEDER, Mr. SERRANO, Mr. STARK, Mr. SYNAR, Mr. TORRES, Mr. TRAFICANT, Ms. WATERS, and Mr. WYDEN) introduced the following bill; which was referred to the Committee on Energy and Commerce

MARCH 18, 1994

Additional sponsors: Mr. ACKERMAN, Mr. EDWARDS of California, Mr. EVANS, Mr. FALEOMAVAEGA, Mr. FILNER, Mr. FROST, Mr. MATSUI, Mr. OWENS, Mr. YATES, Mr. CONYERS, Mr. JACOBS, Mr. JEFFERSON, Mr. NADLER, Mr. BECERRA, Mr. GENE GREEN of Texas, Mr. OLVER, Mr. SANDERS, Ms. VELÁZQUEZ, Mr. GOODLING, Mr. MORAN, Mr. RANGEL, Ms. ESHOO, Ms. EDDIE BERNICE JOHNSON of Texas, Mrs. MORELLA, Mr. ORTON, Mr. PENNY, Mr. ROMERO-BARCELÓ, Ms. SHEPHERD, and Ms. SLAUGHTER

A BILL

To amend the Public Health Service Act to protect the public from health hazards caused by exposure to environmental tobacco smoke, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Smoke-Free Environ-
5 ment Act of 1993”.

6 **SEC. 2. SMOKE-FREE ENVIRONMENT POLICY.**

7 The Public Health Service Act is amended by adding
8 the following new title at the end thereof:

9 “TITLE XXVII—SMOKE-FREE ENVIRONMENTS

10 **“SEC. 2701. SMOKE-FREE ENVIRONMENT POLICY.**

11 “(a) **POLICY REQUIRED.**—In order to protect chil-
12 dren and adults from cancer, respiratory disease, heart
13 disease, and other adverse health effects from breathing
14 environmental tobacco smoke, the responsible entity for
15 each public facility shall adopt and implement at such fa-
16 cility a smoke-free environment policy which meets the re-
17 quirements of subsection (b).

18 “(b) **ELEMENTS OF POLICY.**—Each smoke-free envi-
19 ronment policy for a public facility shall—

20 “(1) prohibit the smoking of cigarettes, cigars,
21 and pipes, and any other combustion of tobacco,
22 within the facility and on facility property within the
23 immediate vicinity of the entrance to the facility;
24 and

1 “(2) post a clear and prominent notice of the
2 smoking prohibition in appropriate and visible loca-
3 tions at the public facility.

4 The policy may provide an exception to the prohibition
5 specified in paragraph (1) for one or more specially des-
6 ignated smoking areas within a public facility if such area
7 or areas meet the requirements of subsection (c).

8 “(c) SPECIALLY DESIGNATED SMOKING AREAS.—A
9 specially designated smoking area meets the requirements
10 of this subsection if:

11 “(1) The area is ventilated in accordance with
12 specifications promulgated by the Administrator that
13 insure that air from the area is directly exhausted
14 to the outside and does not recirculate or drift to
15 other areas within the public facility.

16 “(2) Nonsmoking individuals do not have to
17 enter the area for any purpose.

18 **“SEC. 2702. CITIZEN ACTIONS.**

19 “(a) IN GENERAL.—An action may be brought to en-
20 force the requirements of this title by any aggrieved per-
21 son, any State or local government agency, or the Admin-
22 istrator.

23 “(b) VENUE.—Any action to enforce this title may
24 be brought in any United States district court for the dis-
25 trict in which the defendant resides or is doing business

1 to enjoin any violation of this title or to impose a civil
2 penalty for any such violation in the amount of not more
3 than \$5,000 per day of violation. The district courts shall
4 have jurisdiction, without regard to the amount in con-
5 troversy or the citizenship of the parties, to enforce this
6 title and to impose civil penalties under this title.

7 “(c) NOTICE.—An aggrieved person shall give any al-
8 leged violator notice of at least 60 days prior to commenc-
9 ing an action under this section. No action may be com-
10 menced by an aggrieved person under this section if such
11 alleged violator complies with the requirements of this title
12 within such 60-day period and thereafter.

13 “(d) COSTS.—The court, in issuing any final order
14 in any action brought pursuant to this section, may award
15 costs of litigation (including reasonable attorney and ex-
16 pert witness fees) to any prevailing plaintiff, whenever the
17 court determines such award is appropriate.

18 “(e) PENALTIES.—The court in any action under this
19 section to apply civil penalties shall have discretion to
20 order that such civil penalties be used for projects which
21 further the policies of this title. The court shall obtain the
22 view of the Administrator in exercising such discretion and
23 selecting any such projects.

1 **"SEC. 2703. PREEMPTION.**

2 "Nothing in this title shall preempt or otherwise af-
3 fect any other Federal, State or local law which provides
4 protection from health hazards from environmental to-
5 bacco smoke.

6 **"SEC. 2704. REGULATIONS.**

7 "The Administrator is authorized to promulgate such
8 regulations as the Administrator deems necessary to carry
9 out this title.

10 **"SEC. 2705. EFFECTIVE DATE.**

11 "The requirements of this title shall take effect on
12 the date one year after the date of the enactment of the
13 Smoke-Free Environment Act of 1993.

14 **"SEC. 2706. DEFINITIONS.**

15 "As used in this title—

16 "(1) the term 'Administrator' means the Ad-
17 ministrator of the Environmental Protection Agency;

18 "(2) the term 'public facility' means any build-
19 ing regularly entered by 10 or more individuals at
20 least one day per week, including any such building
21 owned by or leased to a Federal, State, or local gov-
22 ernment entity. Such term shall not include any
23 building or portion thereof regularly used for resi-
24 dential purposes; and

25 "(3) the term 'responsible entity' means, with
26 respect to any public facility, the owner of such facil-

1 ity, except that in the case of any such facility or
2 portion thereof which is leased, such term means the
3 lessee.”.

○

Mr. BLILEY. Thank you, Mr. Chairman.

I want to join in welcoming our witnesses and guests to this morning's hearing, especially Administrator Browner and the distinguished individuals who are serving or have served as Surgeon General of the United States. I also want to thank the chairman for inviting former Congressman Whitley from North Carolina to testify so we can have some balance in the debate in this important issue.

I understand the subcommittee will be having at least one other hearing on this issue, and I think that is appropriate because there are a number of other individuals and organizations, including building owners, managers, employers and employees who we should hear from concerning the chairman's legislative proposal.

I am pleased to have another opportunity to discuss this issue with Administrator Browner. I know she is aware of my concerns with EPA's activities on this issue. Unfortunately, nothing has happened since our last hearing to allay my concerns. In fact, just the opposite has happened. We now have legislation, the chairman's bill, that is based on the findings of the EPA's assessment.

I am concerned that EPA deliberately misused scientific data in order to reach a politically motivated result. Through its risk assessment on ETS, EPA tells the American public that exposure to ETS is responsible for 3,000 deaths each year. To reach that conclusion, EPA had to ignore or discount significant studies, or deviate from generally accepted scientific standards.

Mr. Chairman, at the very same time that we were having our hearing on this issue last July, the House Agriculture Committee was holding a similar hearing. That committee heard testimony from Dr. Alvin Feinstein, a noted epidemiologist at Yale University. In his testimony, Dr. Feinstein raised a number of questions with EPA's risk assessment. He said these questions convinced him that a final independent review of the data may be warranted. He also said such a review could take into consideration data that EPA did not consider when it did its own risk assessment.

I would just remind my colleagues that Dr. Feinstein was not testifying on behalf of the tobacco industry. He is a highly respected scientist who looked at EPA's risk assessment for environmental tobacco smoke and saw some serious problems.

We are fortunate to have with us this morning impressive individuals who have served or are serving as Surgeon General of the United States. I will be interested to learn how many of them have looked at EPA's risk assessment on ETS and understood its shortcomings. I will also be interested in hearing how many of them are willing to urge EPA to make sure that its science is as accurate and objective as it can possibly be.

Thank you, Mr. Chairman. I look forward to the testimony of our witnesses.

Mr. WAXMAN. Thank you, Mr. Bliley.

Mr. Wyden?

Mr. WYDEN. Thank you, Mr. Chairman. I want to commend you for all your efforts and also our colleague, Mike Synar, on this issue, and I am pleased to be an original cosponsor of your legislation.

All across this country the fact is that millions of our kids spend huge chunks of their time in buildings that are literally incubators for disease. So this legislation is ultimately legislation for our children.

When a Member votes on this legislation, they have a choice: They can either support the bill and come out for the health of our kids, or they can be opposed to the legislation and come down on the side of the tobacco companies. That is essentially what this legislation is all about.

Mr. Chairman, I don't think it is any accident that the business community is showing significant support for this legislation. I would like to note that the Building Owners and Managers Association has now come out for the bill, and the reason that they have is that the no-smoking policy is good for business. This is legislation that is pro-business. And I would also like to note that Carol Browner, who will be testifying very shortly, has indicated that the health benefits exceed the cost of complying with this legislation.

So I think it is a very significant step forward. I look forward to working with our Members, and I hope we will pass this bill expeditiously.

Mr. WAXMAN. Thank you.

Mr. Synar?

Mr. SYNAR. Thank you, Mr. Chairman.

Very briefly, the environmental tobacco smoke bill is a very fair bill. It is fair because it protects the rights of not only nonsmokers but smokers. It is essential in guaranteeing, I think, that a healthier population of smokers and nonsmokers evolve. It is not going to deprive any person who wants to smoke from smoking cigarettes, but it makes them do it in a responsible manner.

The cost benefit of this is very simple: \$1,000 a year in decreased productivity and health care costs can literally be snuffed out if we take responsible actions through this legislation. As Mr. Wyden says, at a minimum this is a moral children's health issue that we cannot walk away from.

Thank you Mr. Chairman.

Mr. WAXMAN. Thank you.

Without objection, all Members will be granted the right to enter an opening statement in the record at this point.

I would like to call the Administrator of the U.S. Environmental Protection Agency, Carol Browner.

Thank you very much for being here today, Administrator Browner. I understand you had to work hard to appear here because you have a conflict in your schedule with the President releasing his budget. Your appearance today is a real indication of your strong support for this legislation, and we appreciate it.

Your prepared statement will be in the record in full. We would like to recognize you to deliver your oral presentation to us.

**STATEMENT OF HON. CAROL M. BROWNER, ADMINISTRATOR,
ENVIRONMENTAL PROTECTION AGENCY**

Ms. BROWNER. Thank you, Mr. Chairman.

I would like to thank all of the members of the subcommittee here today. We appreciate the opportunity to appear before you again today to discuss the serious public health issue of second-hand smoke. This is an issue about which I care deeply.

And so I am very pleased to be here to comment on H.R. 3434, the Smoke-Free Environment Act of 1993, and to relate to the subcommittee some of our preliminary conclusions concerning the economic costs and benefits of H.R. 3434, which you requested, Mr. Chairman.

I think as everyone is well aware, in January 1993 the Environmental Protection Agency published an assessment of the respiratory health risks of passive smoking. Based on the total weight of the available scientific evidence, EPA concluded that widespread exposure to secondhand smoke in the United States presents a serious and substantial public health risk.

EPA also concluded that secondhand smoke is a human lung carcinogen, classified as a group A carcinogen under EPA's carcinogen assessment scheme.

The report concludes that environmental tobacco smoke is responsible for approximately 3,000 lung cancer deaths each year in nonsmoking adults in the United States. Of these, the report indicates that 2,200 deaths are attributable to exposure outside the home, the very environments that H.R. 3434 addresses.

While the finding that secondhand smoke is capable of causing lung cancer in healthy adults has received much public attention, I am personally even more concerned about the very serious respiratory effects on young children. Children have been found to be particularly sensitive to the effects of secondhand smoke.

Infants and young children whose parents smoke are the most seriously affected by exposure, with increased risk of respiratory infection such as pneumonia and bronchitis.

Children exposed to secondhand smoke are more likely to have reduced lung function and symptoms of respiratory irritation. Secondhand smoking can lead to a buildup of fluid in the middle ear, the most common cause of hospital operations in young children.

Asthmatic children are especially at risk. EPA estimates that exposure to secondhand smoke increases the number of episodes and severity of symptoms for between 200,000 and 1 million asthmatic children each year. Secondhand smoking is a risk factor for the thousands of non-asthmatic children who develop the condition each year.

Mr. Chairman, EPA firmly believes that the scientific evidence warrants actions to protect nonsmokers from involuntary exposure to secondhand smoke. We outlined our recommended actions in the testimony we delivered before this subcommittee last July, and the principles of EPA's recommendations are embodied in H.R. 3434.

The bill, as I understand it, would provide comprehensive protection from involuntary exposure to ETS or secondhand smoke in indoor environments to all nonsmokers, children, workers, and the general public. It would also produce a number of important secondary benefits.

Studies indicate that smoke restrictions, particularly where employee-supported cessation programs are offered, help encourage smokers to quit. For smokers who live in homes with high levels

of another indoor air pollutant, radon, quitting smoking greatly reduces their chance of getting lung cancer.

The benefits of quitting smoking are significant. In addition, Federal legislation in this area would level the playing field for businesses that are concerned, correctly or incorrectly, about any potential competitive disadvantage that could result from variations in smoking restrictions across establishments or geographic jurisdictions.

As I understand H.R. 3434, it does not attempt to control individual behavior in the home, nor does it prohibit people who choose to smoke from doing so in most outdoor locations or in buildings which provide properly designed smoking rooms, and we think this is appropriate.

We support H.R. 3434 and we look forward to working with the subcommittee to address concerns with some of the specific provisions of the bill as it is debated.

Mr. Chairman, you formally requested that EPA analyze the compliance costs and the health and economic benefits of H.R. 3434. You asked that we consider eight specific issues. These are complicated issues worthy of comprehensive, in-depth analysis.

We are providing a brief summary of our preliminary analysis today in our written testimony. We intend to further refine the analysis, and will make it available to the subcommittee as well as to the public and for peer review.

The initial preliminary estimates included in our written testimony were prepared under significant resource and time constraints, and are based on a combination of available information, professional judgment, and simple analytic methods.

As is appropriate in such cases as this, upon conclusion of OMB review we will submit all of our analysis, findings and documentation for public comment and peer review before issuing a final document.

Mr. Chairman, based on our preliminary conservative estimates, we do believe that the benefits of H.R. 3434 outweigh the cost. Preliminary estimates of the benefits of H.R. 3434 include improvements in the health of nonsmokers exposed to secondhand smoke and reduced costs for house keeping and maintenance.

These benefits alone appear to exceed the cost of compliance which are primarily associated with separately ventilated smoking lounges and enforcement.

Another category of benefits would include health benefits due to smokers who quit, cut back or don't start. These benefits are significant and could bring a large increase in the benefits of your proposal into the tens of billions or hundreds of billions of dollars per year.

On balance, there would appear to be a substantial economic justification in support of H.R. 3434 based on the specific cost and benefit issues addressed in this preliminary assessment.

Mr. Chairman, in closing, I would like to note that at the Environmental Protection Agency we deal with very difficult and very complicated issues to which solutions can be hard to find. In this particular situation, we do have the ability to avoid the consequences associated with secondhand smoking. And I believe we have an obligation to act where we have that ability.

I would be more than happy to answer any questions.

[The prepared statement of Ms. Browner follows:]

TESTIMONY OF
CAROL M. BROWNER
ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 7, 1994

Good morning, Mr. Chairman and Members of the Subcommittee. I am pleased to be here to testify on the Environmental Protection Agency's (EPA) activities related to environmental tobacco smoke (ETS), to comment on H.R. 3434, the Smoke-Free Environment Act of 1993, and to relate to you some of our preliminary conclusions concerning the economic impacts of H.R. 3434, which you requested, Mr. Chairman.

As you know, in January 1993, the Environmental Protection Agency (EPA) published an assessment of the respiratory health risks of passive smoking, entitled *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*. This report was issued under the authority of The Radon Gas and Indoor Air Quality Research Act of 1986, which directs EPA to conduct research and disseminate information on all aspects of indoor air quality. The report summarizes the findings of the Agency's extensive investigation of the respiratory health risks from exposure to environmental tobacco smoke. It incorporates comments and recommendations from the public as well as two reviews by EPA's Science Advisory Board (SAB), a panel of independent scientific experts in this field. The Science Advisory Board unanimously endorsed both the conclusions of the report and the methodologies employed. The Department of Health and Human Services (HHS) has endorsed the report and the National Cancer Institute within HHS has printed it as one of its series of scientific monographs.

Based on the total weight of the available scientific evidence, EPA concluded that the widespread exposure to secondhand smoke in the United States presents a serious and substantial public health risk. I'd like to briefly summarize the findings of the report.

Findings of the EPA Risk Assessment

Perhaps the most significant conclusion of the report is the finding that secondhand smoke is a human lung carcinogen, classified as a "Group A" carcinogen under EPA's carcinogen assessment scheme. This classification is reserved for those compounds or mixtures that have the strongest evidence of a cause-and-effect relationship in humans. In the case of secondhand smoke, unlike *any other compound the Agency has ever evaluated*, we are able to see a consistent increase in lung cancer risk at *actual* environmental levels, rather than having to extrapolate downward from very high occupational exposures as we have had to do for such other Group A carcinogens as asbestos and benzene. In attempting to quantify the extent of the lung cancer risk, the report estimates that secondhand smoke is responsible for approximately 3,000 lung cancer deaths annually in non-smokers in the United States. Of these 3,000, the report estimates that approximately 2,200 are attributable to exposure outside the home.

ETS also has subtle but significant other effects on the respiratory health of adult non-smokers. These include coughing, phlegm production, chest discomfort, and reduced lung function.

Although the finding that secondhand smoke is capable of causing lung cancer in healthy adults has received the most public attention, I am personally even more concerned about the very serious respiratory effects on young children -- who have been found to be particularly sensitive to the effects of secondhand smoke -- that are documented in our report.

Infants and young children whose parents smoke are at increased risk of lower respiratory tract infections such as pneumonia and bronchitis. EPA estimates that passive smoking is responsible for between 150,000 and 300,000 lower respiratory tract infections in infants and children under 18 months of age annually, resulting in between 7,500 and 15,000 hospitalizations each year.

Children who have been exposed to secondhand smoke are also more likely to have reduced lung function and symptoms of respiratory irritation such as cough, excess phlegm, and wheezing.

Passive smoking can lead to a buildup of fluid in the middle ear, the most common cause of hospitalization of children for an operation.

Asthmatic children are especially at risk. EPA estimates that exposure to secondhand smoke increases the number of episodes and the severity of symptoms for between 200,000 and one million asthmatic children. In addition, passive smoking is a risk factor for the thousands of non-asthmatic children who develop the condition each year.

Policy Recommendations

EPA firmly believes that the scientific evidence is sufficient to warrant actions to protect non-smokers from involuntary exposure to secondhand smoke.

Because of the health implications of exposure to secondhand smoke documented in our report, EPA recommended actions to prevent involuntary public exposure to indoor secondhand smoke, which I outlined before this Subcommittee on July 21, 1993. The recommendations are intended to help parents, decisionmakers, and building occupants take steps to protect non-

smokers from exposure to secondhand smoke and are outlined in the brochure, *What You Can Do About Secondhand Smoke*. EPA's primary recommendations are that:

- Residents not smoke in their home or permit others to do so.
- Every organization dealing with children -- schools, day care facilities, and other places where children spend time -- have a smoking policy that effectively protects children from exposure to environmental tobacco smoke.
- In the workplace, EPA recommends that every company have a smoking policy that effectively protects non-smokers from involuntary exposure to tobacco smoke either through complete bans or limiting smoking to rooms that have been specially designed to prevent smoke from escaping to other areas of the building.
- Employer-supported smoking cessation programs should be a part of any smoking policy.
- If smoking is permitted in a restaurant or bar, placement of smoking areas should be determined with some knowledge of the ventilation characteristics of the space, to minimize non-smoker exposure.

EPA is working closely with public and private sector partners to educate the public about secondhand smoke and actions that can protect non-smokers from the health risks associated with ETS. In cooperation with the American Lung Association, EPA is targeting information on secondhand smoke specifically to lower socio-economic class parents. EPA coordinates closely with the Office on Smoking and Health on their public information efforts, and we are working with a wide range of State and local government agencies to educate the public about the hazards of secondhand smoke.

As you are no doubt aware, many Federal agencies, State and local governments and private sector organizations began to implement some form of smoking restrictions indoors as a result of the landmark reports issued in 1986 by the U.S. Surgeon General and the National Research Council of the National Academy of Sciences. In the year since publication of the EPA report, however, we have seen a rapid acceleration of measures to protect non-smokers in a variety of settings, including workplaces, restaurants, sporting facilities, health and day-care facilities, shopping centers, and a wide range of other public facilities. Hundreds of local ordinances have been passed or introduced in virtually every area of the country since 1991 and it is estimated that about 30% of employees are subject to restrictive smoking policies, of which about 20% are covered by a smoking ban.

Despite this encouraging trend, there are many places where involuntary exposure to secondhand smoke still occurs. Many businesses are concerned about being left at a competitive disadvantage if they go smoke-free, or if their communities enact restrictive smoking ordinances and neighboring jurisdictions do not. While recent studies of the effects of local ordinances on revenues and the experiences of many businesses indicate that smoking restrictions do not reduce sales or revenues for businesses that choose to adopt them -- in fact, many report increases in business from non-smokers -- businesses frequently receive misinformation claiming that smoking restrictions will hurt their business.

Administration Views on H.R. 3434

The Smoke-Free Environment Act of 1993, H.R. 3434, would prohibit the smoking of tobacco products within any building regularly entered by ten or more persons at least one day per week, including State, local and Federal buildings. The bill would allow for the

designation of smoking areas that ensure that air from the area is directly exhausted to the outside and does not drift to other areas of the facility.

Most importantly, passage of H.R. 3434 would provide comprehensive protection from involuntary exposure to ETS in indoor environments to all non-smokers, including children, workers, and the general public.

It would also produce a number of important secondary benefits. First, studies indicate that smoking restrictions -- particularly where employer-supported smoking cessation programs are offered -- help encourage smokers to quit.

In addition, for smokers who live in homes with high levels of another indoor air pollutant -- radon -- quitting smoking greatly reduces their risk of lung cancer, which is ten times greater than for non-smokers. The benefits of quitting smoking in terms of improved health and longer lives are significant.

In addition, Federal legislation in this area would level the playing field for businesses that are concerned -- correctly or incorrectly -- about any potential competitive disadvantage that could result from strong smoking restrictions.

However, H.R. 3434 would not attempt to control individual behavior in the home, nor would it prohibit people who choose to smoke from doing so in most outdoor locations or in buildings which choose to provide properly designed smoking rooms, and we think this is appropriate.

We support the bill and we look forward to working with the Subcommittee over specific concerns as the bill is debated.

It is important to recognize that the Occupational Safety and Health Administration (OSHA) has a central role to play on all safety and health issues in the workplace, under the

Our analysis seeks to account for the benefits and costs associated with social policies such as H.R. 3434 that severely restrict smoking in virtually all indoor environments outside the home. I will summarize today some of the preliminary results of our analysis, and identify important areas of uncertainty that we will try to resolve with further analysis and through peer review. The preliminary analysis appears to suggest that restrictive smoking policies, such as those embodied in H.R. 3434, would provide substantial net benefits to society.

Preliminary estimates of the benefits of H.R. 3434 would include improvements in the health of nonsmokers exposed to ETS, and reduced costs for housekeeping and maintenance. These benefits alone appear to exceed the costs of compliance, which are primarily associated with separately-ventilated smoking lounges, and enforcement. Another category of benefits that were estimated is health benefits due to smokers who quit, cut back, or do not start. In adding such benefits, however, it is important to recognize that we have not calculated the impacts that many smokers believe that they would suffer in terms of inconveniences and perceived hardship as a result of such a nation-wide policy. There would also be an associated increased enjoyment and reduced inconvenience of non-smokers in environments that H.R. 3434 would make smoke-free.

The reduction in non-smoker mortality due to reduced exposure to ETS is estimated to range from about 5,000 to 9,000 lives per year. The total value of medical cost savings and reductions in lost earnings for non-smokers is estimated to be on the order of \$1.5 billion to \$3.0 billion per year. If one considered the economic value that people assign to reduced risk of death, our estimate would be on the order of \$22 billion to \$43 billion per year.

Occupational Safety and Health (OSH) Act. In September of 1991, OSHA issued a Request for Information on secondhand smoke and indoor air issues to begin to assess what appropriate action, if any, should be taken to address these issues under the OSH Act. Because of OSHA's role in regulating the workplace, further discussion between the Federal agencies involved and this Subcommittee may be warranted.

The Administration agrees with and appreciates the fact that Section 2702 of H.R. 3434 does not place the burden of enforcing the bill solely on the Federal government, since the burden of such an enforcement program, if placed solely on government, could be severe.

Costs and Benefits of H.R. 3434

Mr. Chairman, you requested that EPA analyze the compliance costs and the health and economic benefits of H.R. 3434. Eight specific issues were to be assessed. I am providing a brief summary of some of the general findings of our preliminary analysis today. We expect to complete and refine our analysis and submit it to your Subcommittee and to the public within the next several weeks.

Let me preface my review of our preliminary response to your queries by saying that these estimates were prepared under significant resource and time constraints, and are based on a combination of available information, professional judgement, and simple analytic methods. While important data and information on many issues raised in the request are lacking, we are making every effort to be responsive to the request and will provide quantitative estimates. We believe these estimates will shed light on the overall magnitude of the impact and the relative benefits versus costs.

In addition, a substantial potential savings in housekeeping and maintenance expenses of buildings seems to be possible and could be in the \$5 billion to \$10 billion dollar range.

The reduction in smoker mortality due to smokers who quit, cut back, or do not start is estimated to range from about 33,000 to 99,000 lives per year. The total value of medical cost savings and reductions in lost earnings of smokers, is estimated to be on the order of \$5 billion to \$16 billion per year. If one considered the economic value that people assign to reduced risk of death, our estimate would be on the order of \$157 billion to \$470 billion per year. These benefits may be placed in context by recognizing that approximately 400,000 deaths per year in the United States are estimated to be caused by smoking.

The costs of complying with H.R. 3434 include the cost of establishing and maintaining a policy and the cost of constructing and maintaining smoking lounges for those establishments which choose to have them. At this time, our best estimate of the costs associated with implementing H.R. 3434 is in the hundreds of millions of dollars per year, and may reach into the billions of dollars if enforcement costs become large and/or a larger than estimated proportion of establishments opt to provide smoking lounges. In addition, we have not yet included the cost of smoking cessation programs which might be offered to assist smokers who want to quit as a result of this legislation.

One important source of uncertainty in this analysis is the effect on labor productivity of H.R. 3434. Another is the cost associated with enforcement and compliance issues. As EPA refines its analysis we will strive to assess these uncertainties. Other effects of this policy, such as those on the tobacco industry and federal budget implications have not been estimated in our analysis.

On balance, there would appear to be substantial economic justification in support of H.R. 3434, based on the specific cost and benefit issues addressed in this preliminary assessment.

This concludes my prepared testimony. I would be pleased to respond to any questions you may have.

Mr. WAXMAN. Thank you very much, Ms. Browner.

Let me start the questions myself. You testified before us 6 months ago, and you recommended that businesses have smoke-free policies because of the dangers of environmental tobacco smoke. We introduced H.R. 3434 last November with over 50 co-sponsors, and this hearing today is on that legislation.

For the record, could you repeat again—I know you said this in your opening statement—but what is the administration's policy on this piece of legislation?

Ms. BROWNER. Mr. Chairman, we support the comprehensive nature of the legislation and we would like to work with you and the members of the subcommittee as the bill moves forward to address some specific points.

Mr. WAXMAN. I want to commend you and the Clinton administration for the courage to endorse this legislation. It is more far-reaching than any other bill that any other administration has taken on in the smoking area. And as you indicated, just the preliminary evaluation of the cost benefit or the risk assessment involved is far-reaching, and we are going to get enormous benefits as a result of legislation such as this.

I asked EPA to prepare that cost-benefit analysis, and I know you don't have it to give to us in its entirety, but you do have preliminary findings, and I think it would be helpful to go over some of those preliminary findings.

How many lives do you estimate that enactment of this bill would save each year?

Ms. BROWNER. We estimate 38,000 to approximately 100,000 lives would be saved each year. That is the result of a reduction of secondhand smoke exposure and from individuals quitting, not beginning smoking, or reducing their consumption of cigarettes.

Mr. WAXMAN. Can you think of any other environmental legislation that is pending before the Congress that will save as many lives?

Ms. BROWNER. We certainly believe that this one is significant. We have a number of proposals we have provided to Congress that we think are also significant in protecting the public's health. We have not compared this to those pieces of legislation, but it is clear from the analysis that you requested that the lives saved are significant.

Mr. WAXMAN. In dollar terms, what is the economic value that EPA would attribute to saving those lives?

Ms. BROWNER. In the analysis that we have conducted thus far, Mr. Chairman, we used a dollar figure that is used in some of our other programs in terms of lives saved. It is approximately \$5 million, or \$4.8 million. So you would multiply the lives saved by that dollar amount.

Mr. WAXMAN. Your analysis also shows that it will produce economic savings. One saving is a reduction in medical expenses and lost earnings. How large are these savings?

Ms. BROWNER. Again, we break our analysis into two components. For the people who are not smokers, who would be spared exposure to secondhand smoke, we estimate the reduction of medical expenses and lost earnings to be \$1.5 billion to \$3 billion. For

those people who do smoke, the savings are higher, approximately \$5 billion to \$16 billion.

Mr. WAXMAN. For the record, we will have reduction in building maintenance costs; cleaning and painting costs are significantly reduced in smoke-free buildings. Do you have a figure on how much these savings might amount to?

Ms. BROWNER. Mr. Chairman, there are approximately 63 billion square feet of commercial space in this country. There are two types of costs associated with smoking in these spaces. One is housekeeping costs and the other is maintenance (e.g., painting, changing filters, etc.). The estimated savings for housekeeping and maintenance costs are approximately \$5 billion to \$10 billion per year.

Mr. WAXMAN. On the other side of the ledger, how much do you estimate it will cost for businesses to comply with this legislation?

Ms. BROWNER. We looked at several categories of costs associated with compliance with H.R. 3434, the first being the cost for buildings to put in place or building owners to put in place a non-smoking policy. We estimate that to be less than \$0.5 billion a year.

The second issue that we looked at is the cost associated with the construction of a smoking area that would be properly ventilated, and that would meet all the recommendations which we have previously testified about, which are in keeping with R. J. Reynold's recommendations for such smoking rooms. If every building in the country were to install such a facility, we estimate the total cost to be between \$3 billion and \$3.5 billion.

We do not believe, however, that every building will choose to act that way, and so the cost could well be less.

Mr. WAXMAN. Ms. Browner, risk assessment and cost-benefit analysis seem to be popular slogans this year. Given the results of your risk assessment on ETS, which you released a year ago in your cost-benefit analysis, what priority would you give to reducing involuntary exposure to involuntary tobacco smoke?

Ms. BROWNER. The highest priority, Mr. Chairman. As I said, there are solutions available to the problems associated with the exposure to secondhand smoke which we think are easily achievable, readily available, and therefore should be secured for the benefit of all people.

Mr. WAXMAN. Thank you very much.

Mr. Bliley?

Mr. BLILEY. Thank you, Mr. Chairman.

I read with interest your testimony that Chairman Waxman had asked you to conduct a cost-benefit analysis of this bill. I am a little concerned about your reporting conclusions that appear to be very, very preliminary. Should I assume you will be doing more work at the request of the chairman?

Ms. BROWNER. As I said in my statement, these are preliminary assessments. As is the case with all EPA reports, this analysis will be subjected to a thorough OMB review, which includes the Council on Economic Advisers. Public comment will be solicited and peer review undertaken.

Mr. BLILEY. Thank you.

You say that H.R. 3434 would result in potential savings in housekeeping and maintenance expense of buildings, and in response to the chairman's question you put a figure on this of \$8 to \$10 billion. That is a very large estimate. How much have EPA's cleaning and maintenance costs gone down since it banned smoking in its own buildings?

Ms. BROWNER. We would be more than happy to provide that to you in writing, Mr. Bliley. I don't know the specific answer to that question.

Mr. BLILEY. You don't have that today, but do you know it would be \$8 to \$10 billion for buildings across the country? You estimate \$8 to \$10 billion would be the savings across the country, but in your own instance you don't know how much?

Ms. BROWNER. I don't know the precise dollar amount but we will get that for you, absolutely.

[The material will be supplied directly to the subcommittee under separate cover.]

Mr. BLILEY. Thank you very much.

As you might expect, I have many questions about H.R. 3434, but before I get to the specifics, I would like to review with you some of the concerns I have with the risk assessment on ETS, because I think EPA's risk assessment is flawed, and if the risk assessment is flawed, then the legislation is flawed.

When you testified before the subcommittee on this issue last July, you acknowledged that EPA had issued its risk assessment on ETS without taking into consideration a new and significant study completed by Dr. Browson and others. Would you tell us again why EPA did not consider this study when it conducted its meta analysis on the relationship between ETS and lung cancer?

Ms. BROWNER. As I testified previously, the Environmental Protection Agency's risk assessment on environmental tobacco smoke was developed over a 4-year period, during which the science was subjected to rigorous scrutiny on two separate occasions by an independent science advisory board.

The study you make reference to, as well as three other studies relating to ETS and lung cancer, were not included in that risk assessment because they were completed after the date determined to be the appropriate date for inclusion in this study. But as I understand the findings, Mr. Browson's own conclusions, to quote, "Ours and recent studies suggest a small but significant risk of lung cancer from passive smoking", they are not inconsistent with our findings.

Mr. BLILEY. Is it true that he found no significant statistical relationship between ETS and lung cancer, even at the 95 percent confidence interval?

Ms. BROWNER. As we testified previously, Mr. Bliley, in terms of the two tail versus one tail issue, and I was joined by Dr. Mort Lippman, who had participated in the science advisory board's scientific review, that was an appropriate decision to make. It was appropriate methodology to apply to the evidence which we were reviewing.

Mr. BLILEY. Was EPA under any legal deadline or any other kind of deadline to publish its risk assessment by early 1993?

Ms. BROWNER. I am not aware of any legal deadline that the agency was under to publish that risk assessment. There may well have been one. I am not aware of one.

Mr. BLILEY. Has EPA redone its risk assessment on EPS to take into account the results of the three studies you mentioned?

Ms. BROWNER. No, we have not undertaken to redo the risk assessment. We believe that it was a thorough assessment; it has been subjected to scientific peer review.

Mr. BLILEY. Why would you not want to take into account the results of the largest case-controlled study ever done in the United States on ETS?

Ms. BROWNER. Again, Mr. Bliley, it is not a question of not wanting to take into account something. It is a question of developing a model, a period for analysis, a scientific review component, and that study was not completed within a time frame that would have allowed it to be appropriately involved in this study, undertaken by EPA.

Mr. BLILEY. You mean if something comes up after you have done a study, you don't ever want to look back at it?

Ms. BROWNER. Quite the contrary, we frequently do take into account new data. But at this point in time, we have not undertaken to redo the risk assessment. We believe it is justified, it is based on the weight of the science available.

Mr. BLILEY. Ms. Browner, I see my time is up, but I sent you a letter on November the 16th concerning Congressman Kennedy's indoor air legislation. What is the status of the reply?

Ms. BROWNER. Mr. Bliley, as I understand, a draft response is in the OMB review process and we hope to be able to provide it to you shortly.

Mr. BLILEY. Thank you.

Mr. Chairman, I would like to submit questions to the Administrator for a written response.

Mr. WAXMAN. We would like to ask the Administrator to respond in writing to questions that will be submitted by Mr. Bliley or other members of this subcommittee who wish to submit questions to you in writing for a response for the record.

Ms. BROWNER. We will certainly do that, Mr. Chairman.

Mr. WAXMAN. Thank you.

Mr. Wyden?

Mr. WYDEN. Thank you, Mr. Chairman.

I think it is important to note that this Brownson study which my colleague from Virginia is quoting did conclude, and I quote, "In summary, our study and others conducted during the past decade suggest a small but consistent elevation in the risk of lung cancer in nonsmokers due to passive smokes. The proliferation of Federal and State and local regulations to prohibit smoking in work sites and public places is well founded."

Ms. Browner, what I am particularly interested in is the effect of environmental tobacco smoking on kids. I have a 4-year old, and a 9-year-old. I see these youngsters, hours at a time, in effect trapped in these buildings where there is so much smoke, I literally call them incubators of disease.

The EPA statistics on kids who suffer seem to me to just be staggering. More than 150,000 are afflicted with bronchitis or pneu-

monia from environmental tobacco smoke each year, and up to 1 million asthma sufferers are triggered or worsened. You are talking about health care tragedies in monumental numbers; is that correct?

Ms. BROWNER. I would certainly agree with you, Mr. Wyden. As I said many times in my statements with regard to this issue, while the focus has been on lung cancer deaths in adults that do not smoke, the real tragedy are the children.

Mr. WYDEN. From a public health standpoint, is there any other measure that is before the Congress right now that could have a broader impact on improving kids' health in this legislation?

Ms. BROWNER. I can't say that I am aware of every single bill that is pending in this body. This is certainly significant. These are avoidable consequences. And we need to act to ensure that the health of our children is not unnecessarily impacted.

Mr. WYDEN. So this would be, let me say, extraordinarily significant for the health of kids if Congress enacted this?

Ms. BROWNER. Absolutely.

Mr. WYDEN. Now, with respect to exposure outside the home, we are going to hear from the Tobacco Institute a bit later arguing that most of the risk of environmental tobacco smoke exposure occur as a result of exposures inside the home. Therefore, the institute would argue that the bill is illogical because of its focus on exposures outside the home.

Your risk assessment seems to reach the opposite conclusion. For instance, according to your risk assessment, over 70 percent of the lung cancer deaths from environmental tobacco smoke exposure occurs as a result of exposures outside the home.

Could you comment for the subcommittee on the significance of exposure to environmental tobacco smoke outside the home. And in your view, are exposures that occur outside the home a major environmental threat?

Ms. BROWNER. Yes, Congressman Wyden. We are extremely concerned about the exposures outside of the home. As I said, with nonsmoking adults, there are 3,000 lung cancer deaths a year, of which 2,200 occur from exposures outside the home.

I think the statements that you suggest that have been made or will be made by others are not accurate. Our analysis has found that 75 percent of the public is regularly exposed to secondhand smoke at work, or in public places, and that is what this bill seeks to address.

Mr. WYDEN. Let me ask you to address the enforcement of this legislation. The chairman and others worked to try to find a non-bureaucratic enforcement arrangement. The citizen's suits are used here. It doesn't mean that a business complying with the law will be subject to a lawsuit if one customer inadvertently smoked a cigarette. Enforcement can only be taken if the business continues to violate the law 60 days after the notice of violation. So it seems to me a responsible business is given a significant amount of time to come into compliance before they would be subject to a lawsuit.

Do you think that is a reasonable kind of approach so that we don't enforce this with some kind of cumbersome, big-government kind of approach?

Ms. BROWNER. I would agree that it is important to note that H.R. 3434 in its enforcement provisions does allow for a period of time to come into compliance, that it is not immediate, that the enforcement actions are not taken the day of or the day after a violation, but rather, there is time.

Mr. WYDEN. Mr. Chairman, I would only say that the Wall Street Journal last year ran an extraordinarily important article called "Smoke and Mirrors: How Cigarette Makers Keep Health Question Open Year After Year." They ran that on the front page last year. I would ask that it be made a part of the record, because I think this is something that really needs to come out to the public about how this debate has been distorted so often, technically as Ms. Browner has said, to the detriment of health care to our children.

Mr. WAXMAN. Without objection that document will be made part of the record.

Thank you.

[The information follows:]

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Smoke and Mirrors

How Cigarette Makers Keep Health Question 'Open' Year After Year

Council for Tobacco Research Is Billed
as Independent But Guided by Lawyers

An Industry Insurance Policy

By ALIX M. FREEDMAN
And LAURIE P. COHEN
Staff Reporters of THE WALL STREET JOURNAL

This is the story of the longest-running misinformation campaign in U.S. business history, and how it may ultimately backfire on its corporate sponsors.

The tale opens in 1954. Cigarette smoking, like tail fins and the new music called rock-and-roll, was fun and glamorous. But a warning had just been sounded that smoking might not be good for you. A scientist at Memorial Sloan-Kettering Cancer Center had painted tobacco tars on the backs of mice and produced tumors. The tobacco industry met this sudden threat head-on.

In full-page newspaper ads headlined "A Frank Statement to Cigarette Smokers," tobacco companies announced that a new research group, funded by the industry but independent, would examine "all phases of tobacco use and health." Its solemn pledge: "We accept an interest in people's health as a basic responsibility, paramount to every other consideration in our business."

The tobacco industry's main vehicle for damage control was up and running.

Sowing Doubt

For almost four decades, the Council for Tobacco Research in New York has been the hub of a massive effort to cast doubt on the links between smoking and disease. Sponsored by U.S. tobacco companies and long run behind the scenes by tobacco-industry lawyers, the ostensibly independent council has spent millions of dollars advancing sympathetic science. At the same time, it has sometimes disregarded, or even cut off, studies of its own that implicated smoking as a health hazard.

"When CTR researchers found out that cigarettes were bad and it was better not to smoke, we didn't publicize that" in press releases, says Dorothea Cohen, who for 24 years until her retirement in 1989 wrote summaries of grantee research for the Council's annual report. "The CTR is just a lobbying thing. We were lobbying for cigarettes."

Many companies under attack for their products have underwritten research to buttress safety claims. What sets the tobacco industry apart is the scope, aggressiveness and persistence of its under-

taking. For decades rival tobacco companies have acted in concert to combat the growing body of evidence linking their products to cancer, heart disease and emphysema.

Cheap Insurance

The U.S. Centers for Disease Control today links 434,000 deaths a year to smoking. The surgeon general has declared smoking "the single largest preventable cause of death and disability," citing "overwhelming" evidence from no less than 50,000 studies. Yet the wisp of uncertainty supplied by the Council has always been enough to protect the \$50 billion industry in Congress and especially in court, and tobacco companies have never paid a dime in product liability claims.

Addison Yeaman, a former Brown & Williamson Co. lawyer and ex-chairman of the Council, says the passage of time hasn't altered his faith in this view expressed at a Council meeting in 1975: The "CTR is (the) best and cheapest insurance the tobacco industry can buy, and without it, the industry would have to invent CTR or would be dead."

Michael Pertschuk, a former chairman of the Federal Trade Commission, finds the industry's defense extraordinary: "There never has been a health hazard so perfectly proven as smoking, and it is a measure of the Council's success that it is able to create the illusion of controversy in what is so elegantly a closed scientific case."

A Legal Peril

But now the device the industry has so long used to deflect attack has become its biggest vulnerability. That is because the Supreme Court last year said smokers can sue, accusing the industry of deliberately hiding or distorting smoking's dangers. And the U.S. attorney's office in Brooklyn, N.Y., is conducting a criminal investigation into whether the industry used the Council to defraud the public.

Whether anything will come of the criminal inquiry — and whether plaintiffs can convince juries that the industry did in fact misrepresent health hazards — are very much open questions; just last month, one jury rejected allegations of a conspiracy. But if plaintiffs should begin to succeed, perhaps by gaining access to now-secret Council documents, they could turn on its head what up to now has been an almost totally winning industry strategy.

The Council for Tobacco Research declined to respond to questions about its activities, as did all of the Big Six tobacco companies — Phillip Morris Cos., RJR Nabisco Holdings Corp., American Brands Inc., B.A.T. Industries PLC (parent of Brown & Williamson), Loews Corp. (parent of Lorillard) and Brooke Group Ltd. (parent of Liggett Group).

At the outset, many in the industry thought the late-1953 crisis posed by the Sloan-Kettering mouse research was entirely manageable. With the Council, "the industry was told that in the best of worlds, we'd do a great service to mankind," says James Bowling, a former Philip Morris director. "Our product either would be exonerated or, if involved (in causing cancer), they'd identify the ingredients and we'd take them out. We thought this was marvelous."

So apparently did some scientists. The Council snagged a noted figure, Clarence Cook Little, as its scientific director. Thanks to his renown as a former University of Michigan presi-

dent and director of a prestigious laboratory, the Council was able to attract an illustrious scientific advisory board, which culled through proposals from a who's who of American scientists who sought its research grants. Over the years, it has doled out more than \$200 million.

But the Council's role was never just research. It was largely a creature of Hill & Knowlton, the public relations firm, which cigarette merchants retained when the mouse research came out. Hill & Knowlton installed the Council in the Empire State Building in New York, one floor beneath its own offices, with one of the PR firm's staffers as the supposedly independent research council's executive director. Hill & Knowlton also began publishing a newsletter that reported such news items as "Lung Cancer Found in Non-Smoking Nuns," and it helped authors generate books with titles like "Smoke Without Fear" and "Go Ahead and Smoke."

Some people, including many in the news media, were skeptical of the Council. "To reporters, the Council was never independent," says Earl Ubell, a veteran science reporter at WCBS-TV in New York. "It was a wholly owned subsidiary of the tobacco industry." But in the interest of balance, journalists writing on smoking and health routinely included the Council's views.

And many smokers lacked the professional skepticism of reporters. "You would have to have lived in that era to understand — they kept providing false reassurances, so I had no idea that smoking was so very dangerous," says Janet Sackman, who once appeared in ads as Miss Lucky Strike and who now has throat cancer.

As early as 1958, however, the Council had strong intimations from studies it financed that smoking could be dangerous. "Cigarette smoke condensate is a weak mouse skin carcinogen," said a Council-financed study completed in that year.

Ensuing Council-financed research found more links to disease. In 1961, a study of 140 autopsies at a Veterans hospital in Iowa City, Iowa, said "a history of cigarette smoking is significantly related to the incidence of carcinoma." In 1963, researchers at Philadelphia General Hospital and the University of Pennsylvania linked chronic smoking to earlier coronary artery disease and a higher incidence of coronary occlusion.

The Council summarized such results in its annual reports, but it often chose other research to stress to the public. Ms. Cohen, who wrote the summaries, cites a 1965 study that said pregnant women who smoked had smaller babies and were more likely to give birth prematurely. But the industry in 1982 submitted to Congress a study the Council hadn't financed, saying that smokers had no greater risk of premature babies and that low birth weight wasn't a problem.

"In the '60s," says Ms. Cohen, "there was so much bad news about smoking that there really wasn't much the CTR could put out, but anything they could find they would use."

THE LAWYERS STEP IN

By 1964, keeping the case open was no longer just shrewd public relations; it had become a legal imperative. As more Americans came to believe smoking could kill, the number of tobacco liability suits jumped to 17 from seven the year before. And in that year, the Surgeon General labeled smoking a health hazard.

It "was a serious, stunning shock," says Mr. Bowling, the former Philip Morris director. "That's the stage at which the lawyers became a lot more involved."

Needing a defense from science as never before, yet dreading the legal exposure that adverse research would bring, the industry created within the Council a Special Projects division — with lawyers, not scientists, at the helm. Much of what it did was shrouded in mystery. "Everything was cloak-and-

dagger," recalls John Kreisher, a former associate scientific director of the Council. "We weren't allowed on their floor."

The core of the lawyers' operation was a vast database, storing the world's literature on tobacco and health, data on foes and strategy documents. The lawyers began shutting the globe, looking for research and expert witnesses. They sought out studies supporting causation of lung cancer by factors other than smoking and research suggesting the complex origin of all diseases linked to tobacco.

Overtures to scientists usually were handled by outside law firms, especially Jacob, Medinger, Finnegan & Hart in New York. It also served as counsel to the Council, and its Edwin Jacob took the lead role at the Special Projects unit. This arrangement offered crucial advantages. Notes Roy Morse, a former research chief at R.J. Reynolds: "As soon as Mr. Jacob funded" a scientific study, "it was a privileged relationship and it couldn't come into court" because of legal rules protecting attorney-client communications. "So they could do projects that they could bury if they chose."

How often they may have done that is unclear, because 1,500 Council documents are under seal in a federal suit in New Jersey, withheld under the attorney-client privilege. In any case, the industry had other options, such as halting funding after an initial phase. Mr. Jacob and the firm of Jacob Medinger declined to comment.

SCIENTISTS SIGN UP

In 1972, the Special Projects unit gave Hugh Fudenberg, an immunologist, funding to determine whether some people are genetically predisposed to emphysema. Early results indicated up to 10% might be. Dr. Fudenberg planned "to warn high-risk people not to smoke," he says, but before he could his funding was discontinued without explanation. "They may have cut me off because it would have been negative for them," he speculates.

A researcher named Geoffrey Ashton learned the limits of the Council's independence in 1976. He was invited by Mr. Jacob to study whether there might be some genetic factor underlying both smoking and certain diseases. But the study never got funded. Dr. Ashton says the lawyer told him "the presidents of the tobacco companies had turned down the proposal because they didn't think the outcome would be useful to them."

This case, like several others, points up the sometimes-perplexing relationship between scientists and the tobacco Council. Dr. Ashton says he was "very apprehensive" about casting his lot with the industry. What finally won him over? "Not to shock you, but scientists are always looking for money to further their research," Dr. Ashton says.

Likewise, a pharmacologist, Charles Puglia, did a special project for the Council's lawyers from 1979 to 1981, although he believed smoking to be dangerous. He explains: "It was early on in my career and it got me started with a laboratory."

While these scientists hesitated to accept tobacco funding but finally said yes, others, such as Theodore Finley, hesitated and finally said no. Dr. Finley, encouraged by Jacob Medinger lawyers to apply for cigarette research funding, decided to examine whether emphysema can result from a reduction that smokers face in a protective lining of the lung. He soon backed out. "If my theory was correct, it would have discredited cigarettes," he says. "But it would be hard to talk about the evils of tobacco while being supported by them at the same time. This was dirty money — I felt like a prostitute."

The researchers the Council cultivated most assiduously were those of a different breed: contrarians whose work disputed the perils of tobacco. For instance, James F. Smith did two controversial studies in the 1960s and 1970s saying smoke-

less tobacco did not cause cancer. (The surgeon general in 1986 said it raised the risk of oral cancer.)

Although Dr. Smith all but repudiated his own conclusions on CBS's "60 Minutes" in 1985 — urging the public to avoid smokeless tobacco — a short time later he acknowledged he accepted an offer of several thousand dollars from Jacob Medinger lawyers to review scientific literature in preparation for a tobacco liability suit. The plaintiff was the mother of an Oklahoma youth who had died of oral cancer after using smokeless tobacco for seven years.

The Jacob Medinger firm and other defense lawyers won the suit, invoking Dr. Smith's studies as independent research. But there are indications he had longstanding ties to the Council; one court document shows his first study was earmarked a "priority" for funding by Council lawyers 20 years earlier. Dr. Smith says the Council paid for equipment at his department's lab at the University of Tennessee when he was doing his smokeless tobacco studies, though it didn't finance the studies.

REWARDING RESEARCH

Two other favorite scientists of the Council were Carl Seltzer and Theodore Sterling. Dr. Seltzer, a biological anthropologist, believes smoking has no role in heart disease and has alleged in print that data in the huge 45-year, 10,000-person Framingham Heart Study — which found otherwise — have been distorted by antitobacco researchers. Framingham Director William Castelli scoffs at Dr. Seltzer's critique but says it "has had some impact in keeping the debate alive."

Dr. Sterling, a statistician, disputes the validity of population studies linking smoking to illness, arguing that their narrow focus on smoking obscures the more likely disease cause — occupational exposure to toxic fumes.

For both men, defying conventional wisdom has been rewarding. Dr. Seltzer says he has received "well over \$1 million" from the Council for research. Dr. Sterling got \$1.1 million for his Special Projects work in 1977-82, court records show.

In relying on such research, the tobacco industry is "exploiting the margins of science," contends Anthony Colucci, a former top researcher and later director of scientific litigation support at R.J. Reynolds. He offers an analogy: "There's a forest full of data that says tobacco kills people, and sitting on one tree is a lizard with a different biochemical and physiological makeup. The industry focuses on that lizard — that tiny bit of marginal evidence."

R.J. Reynolds is suing Dr. Colucci, an outspoken critic, to keep him from testifying in a trial or talking to the media about tobacco liability, and accuses him of demanding a big consulting contract to keep quiet. Dr. Colucci says Reynolds "manipulated the negotiations" so it can now portray them as an extortion attempt. He adds: "This is a clear demonstration of the extent to which a tobacco company will go to silence someone who is telling the truth."

The Special Projects unit worked in a variety of ways to protect tobacco companies. Lobbying in Congress against advertising curbs, the industry in 1982 submitted to Congress a researcher's statement that peer pressure, not advertising, induced young people to smoke. Congress wasn't told that the research had been funded by Council attorneys. This was no accident. At a meeting of tobacco-company lawyers the year before, Mr. Jacob explained that the reason for funding that particular research as a Special Project was to conceal the researcher's ties to the industry. "We did not want it out in the open," Mr. Jacob said, according to the meeting transcript as cited in a Newark, N.J., federal judge's opinion.

The Council's lawyers weren't content for long to confine

their activities to the Special Projects division. By the late 1960s, they had begun to encroach on the smoking research emanating from the putatively independent Council itself. Often, the Council and its lawyers shared or swapped projects and scientists.

By 1968, the Council had begun putting researchers under contract for many studies. This gave it the right to control both a study's design and publication of the results. However, as a contractor, the Council could be held responsible for withholding negative findings. So its operatives would do their utmost to ensure that ugly surprises didn't arise.

This contributed to a parting of the ways with Hill & Knowlton. "The lawyers had this thing under control," recalls Loet Velmans, a former chief executive of the PR firm. It quit the account in the late 1960s, he says, out of frustration that the industry "for legal reasons felt it couldn't admit to anything (on tobacco and health) because then it would be sued out of existence."

Says Robert Kersey, a former head of tobacco research at Liggett: "Almost everything that transpired had to be done under the advice of counsel so that nothing . . . would incur a potential liability."

SMOKING RODENTS

In 1968, the Council contracted with Mason Research Institute in Worcester, Mass., to evaluate "smoking machines" for animal inhalation studies and do toxicity tests on rodents. As the study drew to a close in 1972, Mason researcher Mianing Hagopian was astonished when scientists from the Council and from R.J. Reynolds began turning up weekly at his lab, where he says they sat for hours taking notes. They made sure that only the most genetically vigorous (that is, cancer-resistant) rodents were going to be used, he says, and dictated which cigarettes and how many puffs were administered to them.

"It got to the point where they were directing the course of the study," says Dr. Hagopian. "It was nowhere near as objective as if it had been funded by" the government.

Although he did complain to Mason's president, Dr. Hagopian concedes he and other researchers mainly "looked the other way." They wanted to make sure the contract was renewed so they could do the critical experiments on whether smoke affects rodents' lung tissues. However, the Council canceled funding before Mason began the animal study.

The Council pulled out the big guns after another study, at Bio-Research Institute in Cambridge, Mass. When Syrian hamsters were exposed to smoke twice a day for 59 to 80 weeks, 40% of those of a cancer-susceptible strain and 4% of a resistant strain developed malignant tumors. Before publishing the study in 1974, the institute's founder, Freddy Homberger, sent a manuscript to Robert Hockett, then scientific director of the Council. Dr. Homberger says he had to do so because halfway through his study, the Council had changed it from a grant to a contract "so they could control publication — they were quite open about that."

Soon thereafter, Dr. Hockett and Mr. Jacob, the lawyer, hastened to Dr. Homberger's summer home in Maine. Their mission? "They didn't want us to call anything cancer," Dr. Homberger testified years later at the Rose Cipollone tobacco liability trial in federal court in Newark, N.J. "They wanted it to be pseudo-epitheliomatous hyperplasia, and that is a euphemism for lesions preceding cancer. And we said no, this isn't right. It is a cancer." Today, Dr. Homberger adds that Mr. Jacob told him he would "never get a penny more" if the paper was published without making the changes.

He compromised. At the last minute, he changed the final proofs to read "micro-invasive" cancer, meaning a microscopic

malignancy. Despite this, his lab was never funded by the Council again.

Dr. Homberger would come to regret his concession. And the Council would find a use for it — on the same occasion on which it eventually would use research from another lab, Microbiological Associates of Bethesda, Md.

WHAT KIND OF CANCER?

The Council contracted with that lab to do the world's largest inhalation study, involving more than 10,000 mice. To do it, the Council spent hundreds of thousands of dollars in a quest for the perfect smoking machine, one that prevented mice from either holding their breath or overdosing on carbon monoxide. The lab initially had considered freedom, says Carol Henry, who was its director of inhalation toxicology. But after nine years of work and \$12 million, the team was told in 1982 that it could no longer meet with Council staffers unless a lawyer was present.

"We had never done science through lawyers before, and we told them it was unacceptable," says Dr. Henry. She says a Jacob Medinger lawyer told her, "That's the way it is."

The scientists knuckled under. If the Council had canceled before all phases of the first experiment were done, 40 staffers might lose their jobs and nine years' worth of data would never come to light.

In the first experiment, in which mice inhaled the equivalent of five cigarettes a day, five days a week, for 110 weeks, 19 out of 978 mice got cancer — versus seven out of 651 controls. However, the tumors weren't squamous-cell carcinomas, the kind usually seen in human lung cancer. And there was a 10% possibility the results were due to chance, whereas scientists prefer no more than 5%. Even so, Dr. Henry says the study built a "very strong case" that cigarettes can induce cancers in animals. This was to be the first of several experiments.

But lawyers from Jacob Medinger told Microbiological the project would go no further. "When a contract is canceled given these kinds of results," Dr. Henry says, "reasonable scientists might conclude the liability issue must have suddenly become apparent to this group." In fact, says Dr. Kreisher, the Council's former associate scientific director, Council lawyers "worried like hell" about it.

Microbiological and the Council parted ways, but the tobacco industry got plenty of mileage out of the Microbiological mice. In 1984, the Council issued a news release noting the absence of squamous-cell lung cancer in the lab's study. The timing wasn't coincidental: That year lawyers from Liggett, Phillip Morris and Lorillard began taking depositions in the landmark case of Mrs. Cipollone, a New Jersey woman whose family claimed she had died of smoking-related squamous-cell lung cancer. And at the federal trial four years later, a witness for the defense said the fact that the smoking mice didn't get squamous-cell carcinoma (although some did get cancer) showed that "cigarette smoke has not been shown to be a cause of lung cancer."

The witness also put Dr. Homberger's Syrian hamsters to good use. Smoking hadn't produced any more than "micro-invasive" tumors in the hamsters, noted the witness, toxicologist Arthur Furst.

Dr. Homberger, regretting he had agreed under pressure to use this milder wording, calls this use of his report "baloney," adding: "It was cancer beyond any question, not only in our opinion but in the view of the experts who looked at the slides." Dr. Furst declined to comment.

The tobacco companies succeeded in planting doubt in

some jurors. "I didn't think it was proven scientifically that smoking caused her lung cancer," says juror Barbara Reilly. She says that under pressure from other jurors, she and two other holdouts went along with a finding in favor of the Cipollones, but managed to hold the damages to \$400,000 instead of the \$20 million some wanted to give. The award was based on false safety assurances by cigarette companies in their pre-1966 advertising.

An appeals court overturned the verdict, saying the plaintiffs had to prove Mrs. Cipollone had relied on the ad claims. In December, the Cipollones withdrew the suit rather than retry it, citing the cost.

The advent of this suit had coincided with the end of the Council's contract and Special Projects research, as well as the waning influence of Jacob Medinger, which departed under pressure in 1984. Tobacco industry lawyers say privately that executives and attorneys grew fearful that the Council, though designed to deflect liability, would wind up incurring just that, because it could be portrayed as having breached a public pledge to do independent research.

LEGAL LANDSCAPE SHIFTS

In fact, by the mid-1980s, the industry had begun to face the very suits against the Council that it feared. In one, the Cipollone family's lawyer, Marc Edell, sued the Council in 1984 on behalf of Susan Haines, the daughter of a lung-cancer victim.

To prove his claims of fraud and conspiracy, Mr. Edell has been trying to get access to the 1,500 Council documents the industry has kept secret by invoking attorney-client privilege. Such privilege can be abrogated in case of fraud, and last year a federal judge in Newark, citing possible evidence of fraud, set in motion the process of making documents available to Mr. Edell. The judge, H. Lee Sarokin, who had been hearing tobacco lawsuits for a decade, wrote a scathing opinion saying that the tobacco industry may be "the king of concealment and disinformation."

A federal appeals court removed him from the case last September for failing to maintain the appearance of impartiality. A new judge will decide the critical issue of whether the industry must divulge any of the 1,500 Council documents.

In the meantime, plaintiffs' attorneys are pinning their hopes on the Supreme Court's ruling last June. The ruling, which grew out of the Cipollone case, said that although cigarette warning labels prevent smokers from bringing "failure to warn" cases, plaintiffs may file suits alleging that cigarette makers intentionally hid or misrepresented tobacco's health hazards. This has led some to view the Council for Tobacco Research as the key to recovering damages from the industry.

But doing so may not be easy. At the end of January, a state court jury in Belleville, Ill., rejected the allegation that companies had conspired to play down tobacco's dangers. Some say winning such a case may depend on getting access to sealed Council documents.

Also facing an uphill battle is the criminal investigation by the U.S. Attorney in Brooklyn, N.Y. Prosecutors are facing statute-of-limitations problems because the Special Projects unit was disbanded more than five years ago.

But what may prove the best protection for the tobacco industry is the readiness of certain scientists to read the evidence differently from the majority. Says Dr. Colucci, the ex-Reynolds employee: "The scientists can come from Mars, but no matter how obscure or how misbegotten, as long as they are willing to tell the scientific lie that 'it's not proven,' the tobacco industry is off the hook." ■

Mr. WAXMAN. Mr. Synar?

Mr. SYNAR. Thank you, Mr. Chairman.

Ms. BROWNER, these conservative statistics you are using today are unbelievable. When you think that we have the opportunity to save \$5 billion to \$10 billion in building maintenance expense, that we have the opportunity to save \$6.5 billion to \$19 billion in medical costs and reductions in lost earnings, when we think about the fact that we could save anywhere between 38,000 to 108,000 lives, this is not peanuts.

Ms. BROWNER. No, it is not peanuts.

Mr. SYNAR. And what was your preliminary cost analysis of H.R. 3434?

Ms. BROWNER. The preliminary numbers showed a cost of \$70 to \$200 million for the policy, to put in place a no-smoking policy, and if every building were to construct a smoking lounge pursuant to our recommendations, that cost would be between \$3 billion and \$3.5 billion. We do not anticipate, however, that every building would construct such a facility.

Mr. SYNAR. It is unbelievable, for that amount of money in investment, how much savings there are.

When you were here in July you talked about an Executive Order regarding the indoor air restriction. Where is that Executive Order right now?

Ms. BROWNER. That is in a review process, and we will answer for you in writing when we anticipate its being signed.

Mr. SYNAR. Is it likely to be in the near future?

Ms. BROWNER. I hesitate to predict a time frame. We will certainly work to see if it can be secured sooner rather than later.

Mr. SYNAR. I would encourage that, since it is important to have the government lead on this issue versus trying to direct others to do it.

One final thing. Do you support the proposition that because there is no Federal regulatory authority over the contents of cigarettes, that either you or the FDA should have some jurisdiction over them?

Ms. BROWNER. Could you repeat the question? I am sorry.

Mr. SYNAR. There is presently no regulatory authority over the contents of cigarettes, although some of the ingredients cause serious health problems. Do you support the proposition that either EPA or FDA should have jurisdiction over the ingredients?

Ms. BROWNER. Congressman Synar, that is not an issue that I have reflected on. I do believe that the Environmental Protection Agency under its authorities to protect the public's health has a responsibility to act as we are so doing to warn the public of the dangers, to suggest solutions, to work with this subcommittee on H.R. 3434. But we would be more than happy to respond to the specific question of the contents.

Mr. SYNAR. Let me put it this way. Is there anything under your jurisdiction as Administrator of EPA that could save more lives? Is there any product that you presently regulate that could save more lives if you had jurisdiction over it than cigarettes?

Ms. BROWNER. Clearly, based on our analysis, the lives to be saved are very, very significant, both in terms of nonsmokers, but also in terms of smokers.

Mr. SYNAR. Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Synar.

Mr. Kreidler?

Mr. KREIDLER. Thank you, Mr. Chairman.

I would like to commend the Chair for holding this hearing, and also the EPA for endorsing this legislation along with the administration. At the State level I was involved with legislation comparable to this. I hope we are more successful than I was at the State level in being able to bring about these changes in the workplace.

I would like to go to the area that hasn't been perhaps talked about too much, and that is some of the specific health effects that happen to the nonsmoker in the workplace, the problems that are generated by asthma and other respiratory problems short of cancer, and certainly diseases that would certainly prove terminal.

Is there any way of estimating what that represents of the total cost of smoking in the workplace?

Ms. BROWNER. The risk assessment that EPA released in January of last year looked at some specific health effects associated with exposure to secondhand smoke. They included lung cancer deaths. They included increased respiratory problems, both in adults and young children. It included a finding of over 400,000 asthma-related incidents a year in young children. There are clear health effects associated with exposure to secondhand smoke.

When we look at the preliminary analysis that we have conducted in terms of H.R. 3434 and its effect, what we have found is that a significant number of lives would be saved, from about 38,000 to more than 100,000 per year as a result of a reduction of exposure to secondhand smoke by nonsmokers, and as a result of people quitting, not beginning to smoke, at reducing their consumption of cigarettes.

You should know that the Centers for Disease Control estimate approximately 400,000 smoking-related deaths per year, which is a significant number. We have also looked at the reduction in medical expenses and lost earnings. The cost savings associated with medical expenses, and lost earnings from exposure to secondhand smoke, is approximately \$1.5 billion to \$3 billion per year, and from smokers who quit, cut back, or do not start is approximately \$5 billion to \$16 billion per year.

Mr. KREIDLER. Smoking interests are going to come forward and say we are putting our attention on one aspect of indoor air pollution; we are not focusing on the sick building syndrome and all of those related problems, that we are just going to the smoking issue. How do you respond to that charge they will be making?

Ms. BROWNER. Our indoor air program seeks to look at a variety of issues: radon, sick building syndrome. The issue we are addressing today is the smoking issue. Again, we do find that after the analysis that we have conducted, which we will submit to thorough review, but the preliminary analysis of H.R. 3434 does show a real cost savings to the American public.

Mr. KREIDLER. We have always found that when you have the ability to address one area so easily and simply as to just eliminate something from the indoor air, why not do it, as opposed to some

of the others that are obviously going to be much more difficult and much more amorphous to get your hands around and correct.

I appreciate your testimony and your endorsement for this legislation.

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Kreidler.

Ms. Browner, I thank you very much for your presentation. I will look forward to getting the completed report, cost-benefit report, and more importantly, to working with you on this legislation.

Ms. BROWNER. Likewise, Mr. Chairman, we believe this is an important piece of legislation. We support H.R. 3434. Our preliminary analysis does show that the costs are not so significant. But the costs of compliance are far less than the benefits that will be derived.

And again, as a mother of a young child, I have a personal interest in this issue. This is a problem we know the solution to. And we have a responsibility to carry forward that solution.

Thank you.

Mr. WAXMAN. Thank you very much for that statement.

[Testimony resumes on p. 130.]

[The report referred to follows:]

The Costs and Benefits of Smoking Restrictions

An Assessment of the Smoke-Free Environment Act of 1993 (H.R. 3434)

Introduction

In August 1993, H.R. 3434, the Smoke-Free Environment Act of 1993, was introduced in the House of Representatives by Congressman Henry Waxman (Chairman of the Subcommittee on Health and the Environment of the Committee on Energy and Commerce) with more than 40 co-sponsors. This bill would require that all nonresidential buildings regularly entered by 10 or more persons in the course of a week adopt a policy that bans smoking inside the building or restricts it to separately ventilated and exhausted smoking rooms. The bill would allow enforcement actions in the United States District Courts by an individual, government, or other aggrieved entity, with allowable fines of up to \$5,000 per day.

H.R. 3434 would effectively ban or restrict smoking in most indoor environments. As written, these environments would include such diverse establishments as office buildings, schools and other educational establishments, theaters, restaurants, hotels, hospitals and other health care facilities, sports arenas, retail establishments, and manufacturing plants.

In a recent letter to Carol Browner, Administrator of the United States Environmental Protection Agency (EPA), Congressman Waxman requested that EPA analyze (quantitatively where possible) the compliance costs and the health and economic benefits of H.R. 3434. Specifically, he asked that EPA assess the cost of compliance including provisions for smoking lounges; the value of benefits resulting from reduced exposure to environmental tobacco smoke and changes in smoking behavior; the value of increased productivity and reduced absenteeism; savings from reduced operation and maintenance costs; and savings in fire related injuries and property damage.

Role and Limits of Cost-Benefit Analysis

In principle, cost-benefit analysis can be a useful tool for helping to identify those government actions which leave society as a whole better off. It can contribute to such assessments by providing a systematic framework for measuring and comparing the net economic benefits of policy alternatives. Cost-benefit analysis does not by itself, however, provide definitive answers regarding the merits of public health and environmental policy alternatives. Rather, net benefit estimates must be combined with other information, and weighed with other policy considerations, to formulate effective public policy. Pursuant to this, and consistent with Executive Order 12866, EPA routinely weighs the full range of relevant policy considerations, such as distributional effects, legal issues, and institutional issues in making regulatory decisions. In keeping with this approach, EPA presents the current analysis, which the Agency believes provides useful insights regarding many of the potential costs and benefits of H.R. 3434.

Summary Results

This analysis indicates that passage of H.R. 3434, or similar restrictions, could achieve net benefits (i.e., benefits minus costs) ranging from \$39 to \$72 billion per year, excluding some potentially significant costs and benefits to smokers. For various reasons these and other potentially significant effects of H.R. 3434 could not be characterized in terms of economic value. Major costs reflected in these estimates include the costs of compliance and enforcement. Major benefits include those associated with reduced exposure to environmental tobacco smoke (ETS) and reduced operating and maintenance expenses. Benefits are also achieved from reduced absenteeism and reduced smoking-related fires, but these are not significant relative to other benefits. The net effect is that estimated benefits exceed estimated costs by \$39 billion to \$72 billion.

As noted above, the current analysis leaves open the question of whether smokers themselves gain or lose due to H.R. 3434. Clearly, smoking restrictions impose a burden on smokers. The losses in terms of time and inconvenience associated with forcing smokers to shift the location and/or timing of their cigarette consumption, and the potential burden associated with quitting, may be substantial. However, these losses would be offset to some unknown extent by the benefits of improved health among smokers who quit, cut back, or fail to start smoking in the first place. The net economic valuation of these and other costs and benefits of smoking to smokers themselves is beyond the scope of this analysis for reasons discussed in more detail below.

Nevertheless, it is important to emphasize that this analysis found that, of those effects which could be quantified, the estimated benefits exceeded the estimated costs by \$39 billion to \$72 billion. In order to reach a finding that H.R. 3434 would impose a net economic loss to society, the net effect of all unquantified costs and benefits — including some important costs and benefits to smokers themselves — would have to be additional costs of at least \$39 billion per year.

Document Review

While EPA makes no commitment to revise and reissue the present study, this document has been developed and submitted to Congress in a form intended for review by outside experts, interested parties, and the public.

The principal author of the study is Dr. David H. Mudarri, an economist in the Indoor Air Division of EPA's Office of Air and Radiation. This version of the study reflects extensive review by other EPA offices, the Office of Management and Budget, the Council of Economic Advisors, and the Department of Health and Human Services. In addition, a previous version of this report was reviewed by several economists in the public and private sectors.

General Methodology

Assessing Annual Costs and Benefits

This analysis assesses the costs and benefits that would occur each year into the future for present and future generations. All estimates are represented as annual cost or benefits. That is, all costs are converted to an annual equivalent that would occur every year into the future based on 1990 population characteristics. Varying time streams of costs or benefits are converted to equivalent annual values using a 3% social discount rate. Sensitivity analyses using 5% and 7% discount rates are also provided.

Throughout this analysis it is assumed that H.R. 3434 would apply to all the previously stated buildings, at all times, without exception. It was also assumed that full compliance would be achieved within the first year of implementation.

Choice of Baseline for Assessing Costs and Benefits

Per capita cigarette consumption has been falling steadily over the past several years. In addition, recent survey data suggest that many establishments already have some form of smoking policy, and the percent of establishments that report having such policies has been increasing in the past few years (DHHS, 1992; BNA 1991). Therefore, it was necessary to establish a baseline from which to measure the effects of H.R. 3434 from enactment forward. This was accomplished by a three step procedure.

In the first step, the net costs and benefits are computed assuming current cigarette consumption levels, and assuming that there are currently no restrictions. This is an artificial baseline used for analytic convenience, but may be interpreted as a reflection of the cost and benefit differences in a society with and without smoking restrictions comparable to H.R. 3434.

Second, survey data were examined concerning the prevalence of smoking policies already in place. Using assumptions about the nature of those policies as well as policies in small establishments not covered in those surveys, an estimate was derived that 23% of the population is covered by smoking restrictions comparable to the requirements of H.R. 3434. Current cigarette consumption levels, and 23% coverage by existing policies are therefore used as the baseline for assessing the effects of H.R. 3434. As a result, this study concludes that 23% of the previously calculated cost and benefits are attributable to existing policies, and 77% are attributable to H.R. 3434, or other future restriction policies, including private initiatives.¹

Finally, sensitivity analyses to the baseline assumptions are conducted by calculating the changes to the costs and benefits that would result from alternative assumptions about future trends. The specific variables tested include future trends in cigarette consumption, and future trends in the development of public and private smoking restriction policies which could take place in the absence of national legislation. These alternative scenarios of potential future trends are intended to demonstrate how the absolute levels of incremental costs and benefits attributable to H.R. 3434 are sensitive to assumptions about the future prevalence of smoking restrictions enacted by other public and private entities, and to future trends in cigarette consumption.

Other Economic Impacts

Economic considerations which legislators may wish to consider go beyond just costs and benefits assessed in this analysis. Where information from this analysis sheds light on some of these considerations, they are briefly described.

¹ As this report was being prepared, the President signed into law the Goals 2000: Educate America Act. This legislation restricts smoking in all federally funded primary and secondary schools and in day care centers. Because a sensitivity analysis is presented of the alternative baseline assumptions, no specific adjustments to account for this new law were made to the 23% baseline calculations used to assess the effect of H.R. 3434.

Assessment of Costs and Benefits In A Society With No Smoking Restrictions

In this section, the costs and benefits associated with smoking restrictions are assessed from a hypothetical baseline in which we assume that no restrictions in the public or private sector are currently in place. The results in this section may be interpreted as measuring the cost and benefit differences between a society with smoking restrictions versus a society without such restrictions. After completing the analysis using this hypothetical baseline, the costs and benefits of H.R. 3434 are assessed under estimates of current baseline conditions, and the sensitivity of these results is evaluated using alternative baseline assumptions.

Section 1. Cost of Implementing Smoking Restrictions

Cost of Implementing Smoking Bans

Despite the apparent wide use of some forms of smoking restrictions, there are no published data on the cost of compliance. While many establishments have smoking policies, it is not common for them to develop compliance cost information. Some preliminary data on compliance costs for worksites may be published soon as part of the Community Intervention Trial (COMMIT) project sponsored by the National Cancer Institute (Lewit, 1993). In the absence of specific data, estimates are developed for start-up costs which would occur initially, and for recurrent costs associated with maintaining the policy once it was established.

In establishing smoking bans nationally, responsible entities would incur initial costs to develop the policy, assign responsibilities, print and distribute information, print and post signs, remove ashtrays and cigarette vending machines, provide outdoor receptacles, and develop compliance procedures. Initial costs include a one time increase in participation in smoking cessation programs. Subsequent to these initial start-up costs, establishments will incur annual costs for policy maintenance. The estimates used in this analysis are provided in Exhibit 1-1. For simplicity, the estimates were developed for a prototype company with 1,000 employees.

According to Bureau of Labor Statistics (BLS) data, in 1990 there were approximately 118 million people in the employed civilian labor force (excludes military). Subtracting approximately 8 million for those who work in farming and the construction trades leaves 110 million persons employed indoors. The 110 million figure is used as the basis for calculating national costs of implementing smoking bans nationally.

The national cost estimate is presented in Exhibit 1-2. Initial costs are annualized in two ways. First, all the initial costs will be experienced in the first year or so that the policy is initiated. The annual equivalent of that initial cost is the interest cost at the appropriate interest rate.² In our analysis, we use a 3% social discount rate for our calculations.

² Since the relevant quantity is the equivalent annual cost that would occur every year, in perpetuity, this is equivalent to borrowing the money and paying interest but no principal every year.

Second, the initial costs will recur when new establishments are formed. We assume a 15% turnover rate every year, so that 15% of the initial cost will be experienced every year by these new establishments.³

Outdoor Shelters with Smoking Bans

A few firms that have thus far established smoking bans now provide some form of outdoor smoking shelter for smoking employees. We assume that 10% of firms that ban smoking will provide this feature, so we included an estimate in our calculations.

A 9' x 12' free standing shelter (similar to a bus shelter) of aluminum frame with acrylic glazing would cost about \$4,800 or \$44 per square foot (Means, 1991). Less elaborate structures, such as a bench under available shelter would cost considerably less. The cost of outdoor shelters is assumed to be, on average, about the same as the cost of indoor shelters, or about \$25 per square foot. Maintenance costs are included in the cost of establishing a smoking ban.

Costs of Smoking Lounges

Smoking Lounge Requirements

H.R. 3434 requires that specifically designated smoking lounges meet appropriate standards for ventilation. To be properly ventilated, a smoking lounge should meet the following requirements (EPA 1993, ASHRAE 1989).

- Air from the smoking lounge should be directly exhausted to the outside by an exhaust fan. Air from the smoking lounge should not be recirculated to other parts of the building. This may require that the plenum (the space between the ceiling tiles and the next floor) be sealed and isolated from the remainder of the building.
- More air should be exhausted from the lounge than is supplied at all times. This insures that the area is under negative pressure, so that smoke does not drift to surrounding spaces.
- The ventilation system should provide the smoking room with 60 cubic feet per minute (cfm) of supply air per smoker. Smoker densities of 7 persons per 100 square feet are often assumed. This air may be supplied by air transferred from other parts of the building such as corridors.
- Nonsmokers should not have to enter the smoking room for any purpose.

Construction of separately ventilated lounges in existing buildings may require modification of the building ventilation system to isolate return air and establish the exhaust system. Because of the requirement that air be exhausted directly to the outside,

³ An establishment here is any new business, as distinguished from a new building. It is assumed that any new establishment would experience the initial costs of establishing a policy.

rooms with an outside wall or on the top floor are preferred. On the outside, exhaust vents must be adequately separated from the air intake vents which supply outside air to the building's ventilation system. The exhaust air may have to be filtered to avoid soiling on windows and on the outside surface.

There are three options for supplying ventilation air to the smoking area. The first is to transfer air from surrounding spaces. This may enter through grills in the door or through a separately constructed supply duct. The second option is to supply air from the main ventilation system, and the third option is to provide a dedicated supply air system for the smoking area. The first option is the cheapest but also the most susceptible to creating ventilation imbalances that compromise the integrity of the building's ventilation system and may generate complaints. The second option requires that the ventilation system have sufficient capacity to satisfy the supply air requirement for the room and still meet the demands of the rest of the system. While most systems are built with excess capacity, a recent increase in ASHRAE requirements for outdoor ventilation (ASHRAE 1989), or higher than designed occupant densities, may reduce that excess. The last option is the most expensive, but will offer the best guarantee that the system operates without complaint.

Number and Size of Lounges

It remains to estimate the lounge area that would normally be supplied to satisfy the smoking population in those establishments that choose this option. There are no published guides to help make this estimate. Therefore, the analysis derives an estimate by formulating an example of a site with 100 smokers. Each smoker is assumed to smoke before work and during lunch which will be outside of the building, and will take a 15 minute break once in the morning and once in the afternoon. Each break will take 3 minutes in transit, and 12 minutes in the smoking lounge. Smokers will visit the lounge over a two hour period, averaging 50 smokers an hour. If evenly distributed over the hour, there would be 10 smokers in the lounge all the time. Assuming a 50 percent variance for peak use gives an estimate of 15 smokers in peak use. Smoking lounges may be designed for 7 smokers per 100 square feet (ASHRAE 1989). This means that about 200 square feet of smoking lounge would be needed to satisfy a peak demand of 15 smokers. The design parameter then is to build 200 square feet of smoking lounge for every 100 smokers to be accommodated, or 2 square feet of lounge per smoking occupant. Exhibit 1-3 provides an estimate of the lounge construction requirements.

Each smoker may count as a smoking occupant in different buildings. For example, a smoker spends some time at work, some time in a restaurant, in a sports facility, etc. Therefore, the number of potential smoking occupants rather than numbers of smokers is a better measure for estimating the number of smoking lounges that may be built. In 1990, there were approximately 46 million smokers in the United States, and about 65% of the adult population was employed. Assuming the same employment rate for smokers would give us an employed smoking population of about 30 million persons who are the smoking occupants for the nation's workplaces. In addition, there were approximately 117 million seat or bed accommodations in educational facilities, restaurant facilities and hospitals (DOE 1991). Assuming a capacity utilization rate of 80%, gives us approximately 100 million

accommodations, of which 25% (25 million) will be used by smokers (About 25% of the population are smokers.). Thus, the total smoking occupant base for our calculations is taken to be 30 million plus 25 million or 55 million smoking occupants.

Cost of Construction and Maintenance of Smoking Lounges

A significant cost element for smoking areas inside buildings is the potential cost of ductwork. Since the area must be exhausted directly to the outside, rooms in the interior portion of the building will require horizontal and/or vertical ducts. Vertical ducts would be used to carry exhaust air from lower floors to the roof of the building through the central core of the building. Horizontal ducts would be used to reach the central core, or to exhaust the air through an outside wall. The building structure can make vertical duct construction prohibitive in existing buildings. Exhausting through the exterior wall can create films of exhaust materials on windows unless the exhaust air is properly filtered, or the exhaust air may infiltrate back into the building under certain conditions.

The Building Owners and Managers Association International (BOMA) reports that retrofitting ventilation systems to accommodate smoking room ventilation requirements is very costly, if not impossible in some cases. In new buildings, the design and installation of separate ventilation systems is reported to cost \$30 - \$50 per square foot (Hurwitz 1993).

Based on conversations with Digital Equipment Corporation and Connecticut Mutual Life Insurance, Environmental Health & Engineering (EH&E) (1992) suggests that lounges cost on the order of \$40 - \$50 per square foot, but could be as low as \$20 per square foot if the room is already adequately enclosed, furnishings exist, and the room can be exhausted to a nearby exterior wall with minimum difficulty.

A firm in Dallas, Texas has made a business of providing smoking lounges to commercial establishments (Poynter 1993). The firm avoids vertical ducts, filters the exhaust air to avoid filming on windows, and provides a service contract to building owners which allows them to pass on the expense to tenants. According to its advertising literature, the firm would charge approximately \$30 per square foot up-front costs plus an annual cost of about \$25 per square foot to completely maintain the space and the ventilation equipment. This includes the rental fee for the space.

National Cost of Compliance under the Smoking Lounge Option

The Poynter 1993 estimate for indoor lounges is somewhat lower than the other estimates. However, it falls within the EH&E range, and is based on real market experience. Further, it is reasonable to assume that the indoor smoking lounge option will be used only when the costs are sufficiently low to make this option attractive. The Poynter estimate is used to calculate compliance cost. It is then increased by 30% to provide a high estimate. Calculations are provided in Exhibit 1-4. An initial average cost of \$25 per square foot would be experienced by all establishments that choose to provide interior smoking lounges to accommodate smokers. This is translated into an annual equivalent cost using a 3% discount rate, to which is added a recurrent portion which would be experienced when

old structures are torn down and new ones built. We assume an average life of 20 years (or a turnover rate of 5% per year), so that 5% of this cost would recur annually.

The total annual cost estimates represent the national cost if every establishment elected to comply with smoking restriction requirements using the smoking lounge option.

Proportion of Establishments Which May Choose to Provide Smoking Lounges

Once fully implemented, only 10% (low estimate) to 20% (high estimate) of employees are expected to be serviced by smoking lounges (see Exhibit 7-3b for justification of this assumption). There are several reasons that most entities are not expected to provide a smoking lounge.

- Smoking lounges would have to meet stringent ventilation requirements and could not be spaces in which nonsmokers would have reason to enter. Most existing rooms with available outside exhaust such as rest rooms would not be allowed.
- Smoking lounges are more expensive and more complicated than smoking bans. It is likely that smoking lounges will be chosen only when they are relatively inexpensive and convenient.
- Smoking lounges may require exceptional diligence to insure that exhaust is adequate, that the space is under negative pressure, and that the building's ventilation system is balanced. Smoking lounges are generally associated with greater complaints and with lower reported satisfaction with the smoking policy than smoking bans, and smoking bans are becoming increasingly popular (Sorensen *et al.* 1991, 1991a, 1992; Stillman *et al.* 1992).
- Smoking lounges compete for space with other potential uses and could result in foregone rental revenue.

Enforcement

Costs to building owners for ensuring compliance in their building is included in the cost of implementing smoking bans. With respect to enforcement by governmental jurisdictions, H.R. 3434 provides no specific requirements for enforcement of its provisions, other than through citizen suits in Federal court. Therefore, enforcement costs are difficult to quantify. Some expenditures by the Federal government and by state and local governments can be expected for information dissemination, though they may well be less than the value of current resources devoted to passing controversial state and local legislation.⁴ These expenditures were not quantified. Information dissemination on a

⁴ Even when smoking restrictions are passed at the state or local level, campaigns to nullify the legislation or to preempt local legislation with weaker state legislation can involve the expenditure of significant resources on both sides of the issue. No attempt was made to quantify current costs to state and local entities, though national legislation would be expected to reduce many of these costs. For an excellent analysis of this issue as it is manifested in California, see Macdonald and Glantz (1994).

uniform requirement at a national level would likely enjoy greater efficiencies, and some reductions in resources currently devoted to passing and maintaining controversial state and local legislation, and in litigating private sector policies, would likely occur.

In a proposed rule concerning the sale or distribution of tobacco products to individuals under eighteen years of age, the Department of Health and Human Services⁵ estimated that sting-type operations used by state governments would cost between \$0.1 billion and \$0.2 billion per year. Recognizing that these two issues are not strictly comparable, an estimate of between \$0.1 billion and \$0.5 billion per year appears plausible, and is used in this analysis as the cost of enforcement in a society with no current compliance with standards comparable to H. R. 3434. (See Exhibit S-2 for estimates of H.R. 3434 under current baseline conditions.)

Section 2: Benefits from Reduced Exposure to Environmental Tobacco Smoke (ETS)

Morbidity and Mortality Effects of Environmental Tobacco Smoke

Lung Cancer and Other Respiratory Disorders

The Environmental Protection Agency conducted a risk assessment of the respiratory health effects of environmental tobacco smoke (EPA 1992). The EPA report reviewed available evidence on the health consequences and estimated lung cancer population risks from exposure to ETS. Included in the EPA report is a summary of the conclusions from other major reports. This summary is paraphrased below.

National Research Council (NRC). At the request of the U.S. Environmental Protection Agency and the U.S. Department of Health and Human Services, the National Research Council (NRC) formed a committee in 1986 to evaluate the methods for assessing exposure to ETS and to review the literature on all of the potential health consequences of exposure. The NRC's report concluded that "considering the evidence as a whole, exposure to ETS increases the incidence of lung cancer in nonsmokers." Correcting for smoker misclassification and background ETS exposure, the NRC calculated an overall adjusted relative risk estimate of 1.42 for lung cancer in nonsmokers from exposure to ETS from spousal smoking plus background sources. The NRC report also suggested a link between ETS exposure and an increase in pulmonary symptoms and respiratory infections in children, chronic ear infections and middle ear effusions in young children, and an increased risk of low-birth weight babies for pregnant women exposed to prolonged exposure to ETS (NRC, 1986).

Surgeon General. Also in 1986, a report by the Surgeon General concluded that available evidence leads to the conclusion that involuntary smoking is a cause of

⁵ Department of Health and Human Services, Substance Abuse and Mental Health Administration, 45 CFR Part 96, Substance Abuse Prevention and Treatment Block Grants: Sale or Distribution of Tobacco Products to Individuals Under 18 Years of Age: Proposed Rule.

lung cancer, and that the children of parents who smoke have an increased frequency of respiratory infections, increased respiratory symptoms, and a slightly diminished rate of increase in lung function as the lung matures (DHHS 1986).

Other Reports. Other major reports provide similar conclusions about various health effects from ETS exposure. The International Agency for Research on Cancer (IARC, 1986) concluded that there was some link between environmental tobacco smoke exposure and lung cancer. In a report supported by R.J. Reynolds, an independent international panel of scientists (Spitzer. *et al.* 1990) concluded that evidence supported a positive association between residential exposure to ETS and the risk of lung cancer. Spitzer. *et al.* also concluded that there is strong evidence that children exposed in the home to ETS have higher rates of hospitalization for severe respiratory illness, and that exposure to ETS is related to asthma in children. Finally, the National Institute for Occupational Safety and Health (NIOSH) (1991) concluded that ETS meets the criteria of the Occupational Safety and Health Administration for classification as a potential occupational carcinogen.

Heart Disease

EPA did not include an assessment of heart disease in its 1992 risk assessment of ETS exposure. However, NIOSH (1991) reviewed recent epidemiological evidence on the link between exposure to ETS and both lung cancer and heart disease. NIOSH (1991) concluded that the recent epidemiological studies "point to a pattern of health effects that is similar for both smokers and nonsmokers exposed to ETS." With respect to heart disease, NIOSH (1991) reviewed the evidence from several studies and concluded that the evidence suggested a possible link between exposure to ETS and an increased risk for heart disease of nonsmokers. The NIOSH (1991) review of the evidence is summarized in Exhibit 2-1c.

Studies reported by Hole. *et al.* (1989), Helsing. *et al.* (1988), and Humble. *et al.* (1990) associated ETS exposure with an increase of heart disease among persons who never smoked. The studies by Hole. *et al.* (1989) and Helsing. *et al.* (1988) are large cohort studies of men and women who live in the same household. Studies of these cohorts demonstrated an excess of heart disease in persons who lived with smokers and never smoked compared with persons who lived with nonsmokers and who never smoked. Furthermore, Hole. *et al.* (1989) and Humble. *et al.* (1990) show an increasing risk for heart disease mortality with increasing exposure to ETS at home. Helsing. *et al.* (1988) found a similar trend in women but not men.

Experimental studies support the hypothesis that ETS exposure has deleterious effects on platelets and the endothelium and can decrease the time to onset of angina pectoris in patients with coronary artery disease.

The evidence suggests a possible association between exposure to ETS and an increased risk for heart disease of smokers.

Several studies have estimated the population risk of heart disease from ETS exposure. Using a relative risk of 1.30 for ETS-exposed nonsmokers relative to unexposed

nonsmokers, Wells (1988) estimated that 32,000 deaths occur each year to nonsmokers from exposure to ETS. Glantz and Parmley (1991) reviewed the epidemiological studies since 1984, including the studies reviewed by NIOSH. They estimated a 30% increase in risk of death from ischemic heart disease or myocardial infarction in nonsmokers exposed to ETS at home, resulting in an estimated 37,000 heart disease deaths per year. They also noted a positive dose response relation between the amount of smoking by the spouse and the risk of heart disease in the nonsmoking spouse. Steenland (1992) analyzed available literature and predicted that exposure to ETS solely from the one's smoking spouse could cause 15,000 to 19,000 ischemic heart disease deaths per year, and estimated overall that 35,000 to 40,000 cardiovascular disease deaths per year were due to ETS exposure.

In a recent position paper, the American Heart Association reviewed the available evidence reported above, including evidence on the mechanisms for inducing heart disease (Taylor, A.E. *et al.* 1992). They concluded that the risk of heart disease is increased by about 30% among those exposed to ETS at home and could be much higher in those exposed at the workplace, where higher levels of ETS may be present. In its position paper, the American Heart Association adopts the Steenland estimate of 35,000 to 40,000 ETS-related cardiovascular disease deaths per year (Taylor, *et al.* 1992).

Base Estimates of Population Risk Used for Calculating Impacts

Restrictions akin to those in H.R. 3434 eliminate almost all nonresidential exposure to ETS. Various time-activity pattern studies suggest people spend about 28% of their time out of the home. About 18% of people's time is spent at work, about 2% outdoors, 4% in transit and 4% in other indoor environments (EPA, 1989). H.R. 3434 would apply to work and other indoor environments, but would only partially affect in-transit exposures. Assuming that between half and three quarters of in-transit exposures are already controlled, and that outdoor exposures are insignificant, this study concludes that H.R. 3434 would apply to approximately 90% of nonresidential exposure to ETS.

Exhibit 2-1a and Exhibit 2-1b summarize estimates of U.S. mortality and morbidity associated with ETS exposure. Using this table as the basis for discussion, the mortality and morbidity estimates to be used in the national cost calculations are summarized below.

Lung Cancer. EPA estimates that 3,000 deaths occur each year from lung cancer due to ETS exposure. Of that number, 73% or 2,200 deaths per year are due to exposure outside of the home.

Other (Nonlung) Cancers. There is insufficient evidence to support inclusion of nonlung cancers in this estimate.

Heart Disease. Reported estimates for the effect of ETS on heart disease fall in the range of 32,000 to 40,000 heart disease deaths per year. Because these estimates are substantial, and because EPA (1992) did not specifically address heart disease in its risk assessment, two conservative adjustments are made to these figures.

- First, the low end of the range (32,000) is used as the high estimate, and this is reduced by 50% (16,000) to obtain the low estimate.
- Second, an arbitrary additional conservative adjustment of 75% is made to this range, providing a base estimate of 12,000 to 24,000 heart disease deaths per year⁶.

The same proportional breakdown between home (27%) and nonhome (73%) exposure-related deaths as was reported by EPA for lung cancer is also used for heart disease. Therefore, 3,240 to 6,480 deaths per year are estimated for home exposures, and 8,760 to 17,520 are assumed to be associated with exposure outside the home.

Burn Deaths. Burn injuries and deaths are estimated elsewhere in this report.

Other Mortality. Studies of the mortality due to ETS exposure from spontaneous abortion and sudden infant death syndrome respiratory conditions in infants, and short gestation and low birth weight are based on maternal smoking. These effects are not included in the estimates presented in this study.

Morbidity. Studies of low birth weight and admission to neonatal intensive care units are based on maternal smoking and are also not included in the current estimates, however, the remaining morbidity effects are included.

Estimated Mortality and Morbidity Effects Of Reduced Exposure to ETS

Home Versus Nonhome Exposures

While smoking restrictions would apply only to nonhome environments, it is estimated in Section 6 below that between 3% and 6% of the smoking population would quit smoking as a result of comprehensive smoking restrictions. It is expected that this will result in an immediate reduction of 3% to 6% of home exposures, and result in a commensurate reduction in premature deaths due to ETS exposures in the home. However, those who quit will eventually die of old age or other causes, so this effect is transitory and will gradually dissipate over a period of some 50 years. Offsetting this is an estimated reduction in the number of persons who take up smoking each year. In Section 6, a reduction of 5% to 10% in the rate at which new smokers enter the smoking population is assumed. As fewer persons enter the smoking population each year, the size of the population decreases, reaching a maximum reduction of 5% to 10% in about 60 years. The net effect of quitting and reduced initiation is an average annual reduction of between 4.2%

⁶ Some adjustment may be appropriate also because there appears to have been an increase in the survival rate of heart disease patients over the past several years due to advances in medical technology.

and 8.5% in the smoking population (Exhibit 2-3). This is assumed to translate into an equivalent reduction in home exposure to ETS.⁷

The greatest reduction in exposure to ETS will come as a direct result of smoking restrictions in nonresidential buildings. Such smoking restrictions in non-residential buildings are expected to reduce nonhome exposures by 90%.

Proportional Reductions in Mortality Risk

The impact of reduced exposure on mortality will not be immediate. It is assumed that the mortality risk for persons will fall over time in the same proportion as the reduction in the mortality risks of former smokers which gradually fall from the time they quit smoking. Exhibit 2-2 presents the proportional reductions in mortality risk (PRMR) from the time of reduced exposure. Calculations are based on the reduction of cancer mortality risk for male smokers since the time of quitting. Heart disease risks are assumed to fall twice as fast. Accordingly, it is assumed that full recovery from excess mortality risk of persons exposed to ETS is accomplished in 20 years.

- Estimated Annual Benefits from Mortality and Morbidity Effects

Value of Premature Deaths Avoided From Reduced Exposure to ETS

Based on the proportional reductions in mortality risks and the assumption that home exposures would decrease by 4.2% to 8.5%, and that nonhome exposures would be reduced by 90%, the number of premature deaths avoided due to reduced exposure to ETS is calculated. Exhibit 2-4 provides estimates of premature deaths avoided in ten year increments, and for 50 year totals. The largest benefits in terms of premature deaths avoided occurs as a result of reductions in nonhome exposures.

"Willingness to pay" measures are used to value the premature deaths avoided due to reduced ETS exposure. Willingness to pay measures assess the value that persons assign to reducing their risk of premature death. The willingness to pay measure used for reduced exposures to ETS is \$4.8 million per premature death avoided.⁸ (See Appendix A-1 for a discussion of this estimate.)

⁷ Estimates are also presented in Section 6 that smoking restrictions will reduce, by 10% to 15%, the number of cigarettes smoked per smoker in a 24 hour period. It has been suggested that some smokers may increase their consumption at home in order to make up for lost consumption outside the home. No attempt was made to account for this possible effect on ETS exposures because this does not appear to be the general case, and because the estimate of reduced consumption used herein is a net reduction over the full day.

⁸ Where possible, we rely on willingness to pay measures as opposed to medical cost savings and savings in lost earnings as the value of avoiding premature death. Using medical costs and lost earnings alone would represent an incomplete measure of the economic value that individuals, and society, assign to avoiding mortal risk. For example, using only medical costs and lost earnings would imply that social welfare is improved when individuals die just after retirement — before medical costs are high and just after salary earnings cease.

As shown in Exhibit 2-4, the reduction in home and nonhome exposures to ETS due to the introduction of smoking restrictions in a society with no restrictions would result in avoiding an average 9,000 to 17,000 premature deaths per year (Exhibit 2-4). The value of these reductions, when using a willingness to pay measure, and discounting future reductions at a rate of 3%, would range from \$39 billion to \$71 billion per year (Exhibit 2-6). (See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

Value of Morbidity Effects from Reduced Exposure to ETS

The estimated reductions in home and nonhome exposures result in reduced morbidity as well as mortality. Morbidity effects from smoking restrictions are shown in Exhibit 2-6. Reductions in the incidence of these effects are assumed to be immediate, with no significant time delay, and are proportional to the reductions in exposure previously discussed. In a society with no current restrictions, the value of reduced morbidity from smoking restrictions would be between \$2.7 billion and \$6.5 billion per year. (See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.) This value is dominated by the value of reduced cases of asthma induction, which is a chronic illness. For this illness, a reduction of between 1,400 and 4,000 cases annually is estimated. To value the benefits from reduced asthma induction, a willingness to pay measure associated with chronic bronchitis⁹ was used.

Section 3. Savings in Operating and Maintenance Expenses

Smoking in a building involves implicit operational and maintenance expenses. In addition to emptying and cleaning ashtrays, the smoke, ashes, and accidental burns on furniture and carpets create an additional housekeeping and general maintenance burden. For example, BOMA reports that in a tightly monitored program, a member firm experienced a 15% reduction in housekeeping costs when a non-smoking policy was introduced. Maintenance costs were not covered in the monitoring program. Changes that were observed included elimination of emptying or cleaning ashtrays; reduction in high dusting and the dusting of desks and tabletops; reduced detailed vacuuming around desks of smokers; and reductions in cleaning of venetian blinds and heating, ventilating and air-conditioning (HVAC) vents. In addition, cleaning personnel found that they spent less time moving articles on desks in order to remove ashes. BOMA cautions that this was a tightly monitored program, and that actual experience may only produce an average of 10% in overall housekeeping costs.¹⁰ Unit cost estimates for smoking and nonsmoking interior spaces cleaning and maintenance are provided in Exhibit 3-1.

Maintenance cost savings include less frequent replacement of furniture, and repair of carpets, fewer repairs of computer equipment operated by smokers, and sometimes less frequent painting. For maintenance expenses, the high estimate is distinguished from the

⁹ Based on willingness to pay measure for reducing incidence of chronic bronchitis (Neumann, et al. 1994), we estimated the value of avoiding chronic asthma to be \$1.5 million per case.

¹⁰ Personal correspondence from James Dinegar, BOMA International to David Mudarri, EPA. January 1994.

low estimate mostly by the inclusion of items for which there was considerable uncertainty. Reduced computer repair costs are applied only to the high estimate for offices. Savings in the replacement of furniture are applied only to the high estimate for offices, health care and educational facilities, and to the high estimate for lodging and food service establishments. Carpet repair savings are included in the high estimate for offices, mercantile and service, health care, assembly, and education, and in the low estimates for lodging and food service establishments. Detailed estimates for maintenance are provided in Appendix B-1.

The actual savings in both housekeeping and maintenance expenses would vary from building to building depending upon use (e.g., offices versus retail stores). To provide an estimate of the impact of smoking restrictions on housekeeping and maintenance operations, we developed separate prototype cleaning and maintenance savings estimates for establishments representing different building uses: office, mercantile and service, food service, health care, assembly, education, lodging, and warehouse and industrial buildings.

The analysis reflects the assumption that the computed savings would not be realized in many buildings. For example, only 43% to 60% of firms with smoking bans report such savings (Carroll, 1990). There are many reasons for this. Firms differ in their needs for cleanliness (e.g. hotels may be more sensitive than offices), some establishments already have partial restrictions, and some establishments have rapidly changing personnel needs, calling for frequent refurbishing activities not related to smoking. Of course, many establishments may experience savings, but may not notice. Finally, and perhaps most importantly, many establishments have permanent cleaning and maintenance personnel are paid fixed salaries, while others may have contractual arrangements that would need to be renegotiated in order for the savings to be realized.

To estimate the square feet of floor area to which estimated savings would apply, two downward adjustments were made. First, these estimates are based only on that portion of the spaces for which the items would apply. For example, persons normally do not smoke in university classrooms, even in the absence of formal smoking restrictions, so savings would result only in the office spaces or other common areas in classroom buildings. Second, using survey data the total commercial square feet for each building use was reduced by about 40% in most cases. These two adjustments were used to arrive at an estimate of the applicable square feet to which estimated savings would apply. The results of these adjustments and the associated savings for each building use category are presented in Exhibit 3-2.

Using the above described procedures, total savings shown in Exhibit 3-2 suggest that a society with no prior restrictions would experience a national savings of between \$3.9 billion and \$4.4 billion per year in housekeeping, and \$1.3 billion to \$5.6 billion in maintenance, resulting in a total savings of between \$5 billion and \$10 billion per year. (See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

Section 4. Increased Productivity and Decreased Absenteeism Resulting from Smoking Restrictions

Effects on Productivity

On-the-Job Productivity Improvements from Reduced ETS. It is generally agreed that exposure to ETS reduces the productivity of "individual" building occupants, probably more for nonsmokers than smokers, though no reliable basis for quantifying this effect could be found. It is also likely that clearly defined and fairly implemented smoking policies will increase "organizational" productivity by reducing potential conflicts between smokers and nonsmokers. Evidence suggests that well-run smoking restrictions are popular among both employees and management, and that when they are well managed and tailored to the social norms of individual worksites, they are effective (Andrews. 1983; Hocking. *et al.* 1991; Hudzinski, 1990; Peterson. *et al.* 1988; Sorensen. *et al.* 1986; Sorensen. *et al.* 1991; Stave. *et al.* 1991). Nevertheless, no basis for quantifying effects on organizational productivity could be found.

Losses in Productivity from Restrictions to Smokers. While reduced ETS exposure would likely have some positive impact on smokers' productivity, the inability to smoke at their workstations would likely have the opposite effect. This could occur for two reasons. First, depending on their level of addiction, some smokers who want to smoke, but are restricted, may become uncomfortable, and less able to work effectively. Second, in order to smoke, smokers would have to leave the workstation and go either to a designated smoking lounge or outside to smoke. The resulting effect on productivity would be limited because taking occasional breaks is already a normal part of the workday for most persons. Thus, while it is likely that some decrement in productivity would result from these two effects, it is not likely to be large relative to the productivity gains from reduced ETS exposure, and it would be difficult to quantify.

Net Effect on Productivity. There are both positive and negative influences on productivity. The ETS effect would *increase* productivity and apply to all employees. However, some smokers would work less effectively and some would spend more time going to and from an allowable smoking area. This may *decrease* productivity, but would apply only to smokers, and only to some portion of the smoking population. Quantitative estimates of these effects could not be developed for this study.

Benefits from Reduced Absenteeism

Several studies suggest that smokers have a greater number of sick leave absences from work than nonsmokers or former smokers. Using data from the 1979 Report of the Surgeon General which estimated that 81 million working days were lost to smoking, and dividing by the number of smokers, Kristein (1983) estimated the excess days lost due to smokers to be 2 days per year. Rice. *et al.* (1986) presents data from the supplement to the 1979 National Health Interview Survey showing an average of 4.9 work-loss days per employed person per year. Non-smokers average 4.3 work-loss days while current smokers and former smokers combined average 5.4 work-loss days (or 25% more than non-smokers). Jackson. *et al.* (1989) also report on other studies which showed 1.5 - 2.2 excess

workdays lost per month for smokers compared with ex-smokers. Unpublished data from the 1991 National Health Interview Survey show a difference in the reported mean days lost of 1 day between smokers and former smokers, and 1.7 days between smokers and never smokers.

The difficulty in making direct comparisons between the absentee rates of smokers and nonsmokers is that smokers are generally less educated, have lower incomes, are more likely to be in blue collar jobs, and are more likely to be alcohol users. These factors could account for some or all of the differences. However, recent evidence suggests otherwise. Reporting on a study of an eastern North Carolina pharmaceutical company, and using a time-series control group design, Jackson, *et al.* (1989) report a significant difference between current smokers and ex-smokers, and between smokers before and after cessation. Likewise, Manning, *et al.* (1991) examined data from the 1983 National Health Interview Survey and concludes that after controlling for age, sex, race, and education, former smokers had 31% more work-loss days and current smokers had 52% more work days lost per year than never smokers.

The 1993 NHIS data show a mean value in days lost from work of 3 days for never smokers. We will use Manning, *et al.*'s results to compute days lost for smokers and former smokers since they controlled for confounding variables. Thus, there are associated 0.9 ($3 \times .31$) absentee days per year saved for each smoker who has quit and 1.5 ($3 \times .52$) absentee days per year for each potential smoker who has refrained from becoming a smoker. Results are shown in Exhibit 4-1.

In Section 6 below, it is estimated that between 3% and 6% of current smokers would quit as a result of national legislation that restricts smoking, resulting in an immediate decrease in the number of smokers and an equivalent increase in former smokers. It is also assumed that the initiation rate for new smokers would decrease by 5% to 10%, resulting ultimately in a proportional reduction in the number of smokers, and an equivalent absolute increase in the number of persons who have never smoked. However, the impact of the reduced initiation rate would gradually take place over a 60 year period.

Finally, the estimated value of excess absences per smoker or former smoker is presented in Exhibit 4-2. The average value of each day lost is taken to be approximately \$104 per day. This is the weighted average of the median daily earnings of white collar, blue collar, and service workers (weighted by the proportion of the smoking population in each of these categories). The reported earnings are inflated by 24% to account for fringe benefits.¹¹

Given that a smoker's average daily earnings including fringe benefits is about \$104, and discounting all future effects by 3% yields an estimated savings of under \$0.5 billion per year (Exhibit 4-3). This is quite insignificant when compared with other effects. (See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

¹¹ The daily earnings are the BLS median weekly earnings divided by 5. The smoking prevalence rates by labor category are given in DHHS 1989.

Section 5: Savings in Smoking-Related Fires

Smoking is the leading cause of fire deaths in the United States. According to the National Fire Protection Association (NFPA), smoking materials were the cause of more than 200,000 fires per year during the decade of the 1980s (Miller 1993). Smoking-related fires refer to those caused by lighted tobacco products, and not cigarette lighters or matches.

Most smoking-related fire injuries and property losses are in residential environments, which would not be subject to smoking restrictions. For example, between 1988 and 1990, there was an annual average of some 1,328 smoking-related fire fatalities in residences compared to an annual average of 38 fatalities in non-residential buildings (Exhibit 5-1). Likewise, property damage due to smoking-related fires over the same period averaged some \$316 million annually for residences, compared to \$115 million annually in non-residential buildings.

This study estimates that smoking restrictions comparable to H.R. 3434 would eliminate 90% of the smoking-related fires in the non-residential sector with smoking bans. A 50% reduction in the nonresidential sector with smoking lounges is assumed. Further, because smoking restrictions are postulated to reduce the smoking population through quitting and reduced initiation, a proportional decrease in residential smoking-related fires is also estimated. Estimated reductions in injuries, deaths, and property damage from smoking restrictions in a society having no such restrictions is presented in Exhibit 5-2. Because a large portion of smoking related fatalities is in residences, the annual benefits from smoking restrictions in public buildings is minimal, and would be on the order of \$0.6 billion to \$0.9 billion per year (Exhibit 5-3). (See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

Section 6: Impacts of Smoking Restrictions on Smokers

The Health and Economic Consequences of Smoking

In 1990, smoking caused an estimated 419,000 deaths in the United States (CDC, 1993a). Of these, approximately 116,000 were caused by cancers of the lung, trachea, or bronchus; 134,000 were caused by heart disease; and 74,000 were caused by respiratory diseases. Significant morbidity consequences are also associated with smoking. Smoking is clearly a major cause of health impairment and death. However, about 25 billion packs of cigarettes are sold each year. This means that individuals, with some knowledge of the risks of smoking, make a conscious choice to smoke, despite the expense and the consequences. Therefore, evaluating the social costs and benefits related to smokers is significantly different from evaluating the social consequences of exposure to ETS or other pollutants.

This subject is approached first by estimating the effects which would result from smoking restrictions on the behavior of smokers and the resulting effects on health. Issues concerning the valuation of these effects are then discussed.

The Impact of Smoking Restrictions on Smoking Behavior

Several parameters which describe the smoking population and its smoking behavior are relevant to assessing the health effects of smoking restrictions. Smoking restrictions may increase the rate at which individuals quit smoking and thereby reduce smoking prevalence, and it may reduce cigarette consumption by those who do smoke. Both of these factors will reduce the per capita consumption of cigarettes, but the impact on health will be less than proportional to this reduction. Those who quit smoking become former smokers. The relative risk of health impairment of former smokers is less than it is for smokers, but greater than it is for persons who have never smoked (never smokers). Similarly, the relative risk for smokers is reduced by their average consumption, but it is not eliminated. Those who quit or reduce consumption will enjoy a longer life expectancy, but the result in annual death rates will take time to develop as the population ages.

Smoking restrictions may also reduce the rate at which nonsmokers take up smoking. Since most persons who initiate smoking do so at a young age, the full impact of this will be manifested over the long term. However, it will have a greater impact on health because the risk of health impairment for persons who never smoked is less than it is for smokers or former smokers.

The Effect of Smoking Restrictions on Smoking Prevalence

There is a plausible presumption that an institutional environment that restricts smoking and that supports abstinence will reduce cigarette consumption among smokers, increase attempts to quit, improve quitting success rates, and reduce the rates at which nonsmokers take up smoking. However, in 1989, the Surgeon General found that evidence of the effect of smoking restrictions on actual smoking behavior was considered to be inconclusive (DHHS 1989). Since that time, a number of studies appear to support the

conclusion that such restrictions have some of the postulated effects on smoking behavior, and that these effects are potentially more powerful than other antismoking efforts. These studies are summarized in Appendix A-2.

Almost all of these studies relate to smoking restrictions in the workplace where smoking behavior was compared before and after institution of a smoking policy. A few studies also compared worksites with smoking restrictions to worksites without smoking restrictions. Only two studies dealt substantively with the effect of smoking restrictions on the decision of nonsmokers to take up smoking (smoking initiation rates). Most studies examined changes in smoking prevalence and the proportion of smokers who quit (quit rates). A few studies also provide data on the extent to which smokers change their consumption habits.

Effect of Smoking Restrictions on Quit Rates¹²

A review of recent studies of the impact of smoking policies on smoking behavior reveals a wide range of potential effects on quitting behavior, including some studies that show no effect at all. Some authors have offered an explanation of this phenomenon (Sorensen and Pechacek, 1989; Stillman, et al. 1990; Woodruff, et al. 1993). Increased quit rates and decreased rates of smoking prevalence that appear to follow the introduction of restrictive smoking policies may reflect the acceleration of quitting behavior around the time the policies are introduced. Since the quit rates are highest among those who otherwise planned to quit and have in the past attempted to quit, it is possible that smoking restrictions result in a rapid increase in quitting followed by a leveling off. Depending upon the time frame in which the changes in behavior are measured, one could observe a wide range of quit rates all reflecting the same basic phenomenon. For example, if behavior was measured just before and then again after the policy, but smokers had already adjusted their behavior in anticipation of the policy was initiated, their reaction would not be measured and changes in behavior would appear to be minimal. Likewise, if behavior was measured just before smokers adjusted their behavior and then soon after, a rather substantial effect would be observed. However, if sufficient follow-up studies were not conducted, one could not tell whether the higher quit rates that were measured were actually maintained over the long term. This analysis adopts this as a plausible explanation of the wide range of behavioral changes observed to date, and incorporates the following derivation of the effect of H.R. 3434 on quitting.

The first step in deriving the quit rate effect of smoking restrictions is to review quit rates reported following implementation of existing workplace smoking restrictions. Recent studies suggest gross quit rates range from 9% to 17% (Exhibit 6-1). These gross quit rates must be adjusted, however, to take account of several factors.

Second, some smokers who quit eventually renew their habit. Historical data suggest this relapse rate is approximately 50% (CDC 1993b). Therefore, to develop an estimate of the quit rate effect of national legislation, the gross workplace quit rate must be

¹² The term quit rate refers to the proportion of smokers who become former smokers in a given time period.

adjusted to net out historical average quit rates observed in the absence of smoking restrictions. Data suggest this rate is approximately 2.5% (CDC, 1993b). Therefore, to develop an estimate of the quit rate effect of comprehensive national legislation, the estimated gross workplace quit rate must be adjusted to take account of relapse. For the current analysis, the relapse rate is lowered to 30% to reflect the characteristics of comprehensive nation-wide restrictions. Specifically, the pervasiveness of nationwide restrictions is expected to reduce overall relapse rates and their implementation is expected to lead to substantial increases in stop-smoking support services and other support programs which would further lower the relapse rate, particularly among workers. Quit rates and relapse rates for smokers not subject to workplace restrictions, however, are assumed herein to remain at long term historical average levels.

Third, an adjustment must be made to account for portions of the adult smoking population who are retired or not employed. This analysis assumes that the smoking behavior of these individuals would not be affected by national legislation. Since approximately, 60% of the adult population is employed, the quit rates estimated for employed persons is reduced by about 40%.

Finally, an assumption must be made regarding the persistence of the effect of national legislation on decisions to quit. Plausible arguments can be made that nation-wide restrictions would have an on-going influence on decisions to quit and on the success of attempts to quit. However, consistent with the preceding discussion of quit rate persistence, the current analysis adopts the conservative assumption that national legislation would lead to only a "one-time" increase in net quit rates among the current population of smokers.

As shown in Exhibit 6-1, the estimated net quit rates resulting from the above approach ranges from 4% to 8% for employed individuals, and from 3% to 6% of the total current adult smoking population. This net quit rate includes those individuals who are retired or otherwise not employed.

Effect of Smoking Restrictions on Initiation Rates

Most persons who become regular smokers do so as teenagers or young adults. About 75% of adults who have ever been regular cigarette smokers report that they tried their first cigarette before the age of 18 and about half of them had become regular smokers by that time. Cigarette smoking among U.S. youth appears to have declined sharply in the late 1970s and stabilized in the 1980s (CDC, 1991).

Wasserman, *et al.* (1991) estimated that legislation that substantially restricts smoking in the workplace would reduce cigarette consumption by teenagers by 41%, and he reports that most of this would result from the effects of reduced initiation among nonsmoking teenagers. If this is interpreted to mean about three fourths of the effect is due to reduced initiation, the 41% reduction would translate into roughly a 31% reduction in initiation. Likewise (Woodruff, *et al.* 1993), when comparing worksites having a few smoking restrictions with those having a smoking ban, reported a 43% difference (37% versus 21%) in the proportion of occasional smokers who become regular smokers.

EPA believes that these studies are not adequate to support the inclusion of a substantial reduction of initiation rates in this analysis. Consistent with the conservative approach to estimating the effect of smoking restrictions on smoking behavior, this analysis assumes that smoking restrictions comparable to H.R. 3434 would reduce initiation rates by only between 5% and 10%. However, unlike the temporary increase in quit rates which would have an immediate impact on smoking prevalence, the effect of reduced initiation would be to gradually reduce the size of the smoking population, and would take more than a generation to reach the majority of its impact. Nevertheless, those who fail to initiate smoking remain nonsmokers, rather than former smokers, so that the health impact of reduced initiation is greater.

Effect of Smoking Restrictions on Cigarette Consumption

With respect to reductions in consumption by smokers who continue to smoke after national legislation is enacted, this analysis relies on recent studies that estimate that workplace restrictions reduce consumption by 18% to 34% (Exhibit 6-1). These estimates are of reduced consumption by smokers who continue to smoke and do not reflect double-counting of reductions in aggregate consumption by smokers who quit. Consistent with the assumption that only the smoking behavior of employed persons would be affected by national legislation, this analysis estimates that the effect of national legislation would be to reduce consumption rates of smokers by about 10% to 15%.

Net Effect of Smoking Restrictions

Based on the assumptions of a one time increase in quit rates and of a reduction in the relapse rate for those who quit, this analysis projects a 3% to 6% decrease in the number of smokers, and a corresponding increase in the number of former smokers. This effect will influence health and death incidence rates, but they will be less than if this were a reduction in the number of persons who had ever smoked. The smokers who remain will be less able to quit, and it is assumed that quit rates and relapse rates for those who remain smokers will be no different than historic levels. However, smokers who continue to smoke will reduce their consumption of cigarettes by approximately 10% to 15%. If initiation rates were not affected, the population of smokers would gradually increase to the level they would be without the passage of smoking restriction legislation. However, the reduction in initiation rates will gradually reduce the population of smokers by about 5% to 10%, resulting in a corresponding increase in the number of those who never smoke.

Health Effects of Smoking Restrictions on Smokers

The reductions in smoking-related premature deaths result from the elevation of quit rates, and reductions in consumption and initiation. The effect on premature death rates depends on the disease, the age of the smoker, and the length of time this change of behavior has been in effect. While a completely rigorous treatment of these effects is beyond the scope of this assessment, simplified assumptions were used to account for these effects and the varying time stream in which these effects occur.

The influence of changing of quit rates on the number of annual deaths due to smoking is calculated in Exhibit 6-2 and Exhibit 6-3. The reductions in mortality ratio for smokers who quit rise with years of abstinence and are provided in DHHS 1990. From this, the percent reduction in mortality ratio (PRMR) for each ten year increment in the time of abstinence is calculated, as presented in Exhibit 6-2. The number of deaths due to smoking for each age group of the population is estimated using data from OTA (1985) and OTA (1993). This is used as a baseline, and the age distribution and the calculated death rates are assumed to remain constant over time in the absence of smoking restrictions. Given the PRMR, the proportion of smokers who quit, and the age of the smoking population, a time stream of premature deaths avoided from quitting is calculated (Exhibit 6-3). This analysis shows that in a society with no smoking restrictions, quitting due to the imposition of smoking restrictions would result in avoiding an annual average of between 5,000 and 11,000 premature deaths per year in the first 50 years. ((See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.) Beyond 50 years, however, the cohort of quitters would have succumbed to death from old age or other causes, resulting in no further effects.

We assume that all persons who initiate smoking are under the age of 35. We use this assumption to calculate the reduction in smoking prevalence over time, given our estimate of reduced initiation. Premature deaths avoided are assumed to be proportional to smoking prevalence in each age group. From this, we calculate the time stream of premature deaths avoided from reduced initiation (Exhibit 6-4). We estimate that, in a society with no smoking restrictions, reduced initiation from smoking legislation would result in an average decrease in premature deaths of between 4,000 and 8,000 per year in the first 50 years, approximately 18,000 per year between the 50th and 60th year, and approximately 20,000 every year thereafter. ((See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

Based on the data presented in DHHS (1989), and DHHS (1990), the mortality ratio for lung cancer appears to be approximately proportional to the number of cigarettes smoked. This proportional relationship is representative of other diseases also, and it is further assumed that the PRMR with years since the time of reduction follows the same pattern as that calculated for quitting (Exhibit 6-2). Using these assumptions, the PRMR for reduced consumption and the corresponding premature deaths avoided due to reduced consumption are calculated in Exhibit 6-5. Relative to a society with no smoking restrictions, reduced consumption from smoking legislation would be estimated to result in an annual average decrease in premature deaths of between 26,000 and 51,000 per year in the first 50 years, and approximately 40,000 every year thereafter. ((See Exhibit S-2 for estimates related to H.R. 3434 under current baseline conditions.)

Life Expectancies and Life Years Recovered from Smoking Restrictions

Premature deaths of young or middle aged persons may be regarded differently than premature deaths of persons in their late 60s. Therefore, an important dimension of the effects of smoking restrictions is an assessment of the life years restored as a result of avoiding premature deaths.

In Exhibit 6-6 survival probabilities and probabilities of death are estimated for persons who have ever smoked and persons who have never smoked using data provided by Hodgson (1992), and using the age distribution of smokers and former smokers. The years lost by premature death to the age of 65 and to life expectancy are then calculated as shown in Exhibit 6-7.

In Exhibit 6-8, the life years extended to age 65 and to life expectancy are estimated and reported by type of smoking behavior impact. Accordingly, it is estimated that those who the average yearly expenditure for medical services for smokers and former smokers exceeds that of nonsmokers. However, this is partially offset by the fact that nonsmokers live longer, and continue to consume medical services during the extra years of life. When both of these factors are taken into account, the result is a net excess burden on the medical service industry of about \$35 billion per year due to smoking.¹³ Implementing smoking restrictive legislation would reduce this excess burden on the medical service industry by reducing the number of smokers and former smokers. Assuming that medical expenditures are proportional to smoking-related premature deaths, every reduction in annual premature deaths avoided by virtue of some smokers quitting, cutting back, or failing to initiate smoking, would represent a reduction of \$85,000 per year for medical services.

Net Effect of Smoking Restrictions on Premature Deaths and Medical Expenses

The results of this analysis suggest that smoking restrictions, relative to a society with no restrictions, would result in significant reductions in premature deaths per year from persons quitting, cutting back, or declining to initiate smoking. These reductions would both extend lives of those affected by 4 to 8 years for those who quit or reduce consumption, or by 15 years for those who decline to smoke. When future values are discounted by 3%, it is estimated that for a society with no current restrictions, this would result in a reduction of approximately \$3 billion to \$4 billion in expenditures for medical services per year. Comparable reductions related to implementation of H.R. 3434 would be about 77% of these values or \$2.3 billion to \$4.7 billion in reduced medical expenditures per year. (See summary of costs and benefits of H.R. 3434 below.).

Value of Benefits or Losses Regarding Smokers

This analysis assumes that, faced with restrictions on where they may smoke, some current smokers would quit and some would reduce overall consumption. In addition, these restrictions would also tend to discourage many nonsmokers, such as teenagers, from becoming smokers.

These changes in behavior would result in significant improvements to the health of smokers themselves, extension of their life expectancy due to the avoidance of

¹³ This is estimated from information provided by Hodgson (1992) who compares excess medical costs over the lifetime of ever smokers and never smokers. Similar data and procedures were also used by Manning et al. (1991).

premature death, and reductions in medical expenses during their lifetime, as well as other benefits such as increased safety and reduced property damage from smoking-related fires.

Clearly, these health benefits to smokers are highly significant. However, there remain 46 million smokers who purchase approximately 25 billion packs of cigarettes annually, and about 1 million persons become regular smokers each year. Since smokers do this despite the risks and costs, one would presume that, provided these persons are rational, fully knowledgeable, and are able to accurately assess the consequences of smoking, including potential addiction, the benefits of smoking to them outweigh the risks and costs. However, for a number of reasons, this study does not attempt to estimate the economic value of the benefits or losses regarding smokers.

First, EPA is concerned that the economic measures traditionally applied to the health consequences of pollution may not be appropriate to use in estimating the social value of physical effects of smoking that occur to smokers themselves. Exposure to pollution, such as ETS, is essentially involuntary and uncompensated. Addiction arguments aside, smoking is a voluntary activity that results in other consequences for smokers, some positive and some negative. These other consequences are not reflected in measures of value for health risk reductions sometimes used by EPA. Applying traditional health risk valuation factors to health consequences for smokers would therefore inappropriately omit the value of all these other costs and benefits to smokers, resulting in potentially biased measures of the value change to society.

Second, analysts disagree whether the traditional economic models one might use to measure the welfare change to smokers can be reasonably applied, particularly given limits on available data. To obtain reasonable estimates of the change in net benefits to smokers, these traditional models require that the subjects, smokers in this case, are acting rationally in response to a free and open marketplace. Furthermore, these consumption decisions must either be devoid of significant price distortions such as taxes and subsidies, or analytical corrections must be made to take account of these distortions. With respect to the rationality requirement, questions have been raised whether the rational consumer choice model applies given the apparent addictive nature of smoking.¹⁴ Questions have also been raised whether the consequences of taxes (e.g., cigarette tax) and subsidies (e.g., tobacco farm subsidies, subsidized health care) significantly distort consumer decision making in this case.

Third, EPA is concerned that currently available data are insufficient to support using a traditional economic model to estimate the change in net benefit to smokers caused by H.R. 3434. The reason for this is H.R. 3434 does not prohibit smoking outright, nor does it change the purchase price or quantity of cigarettes available. Instead, H.R. 3434 only compels changes in the location and/or time pattern of cigarette consumption. This would

¹⁴ Note, however, that some analysts subscribe to models of "rational addiction" which have been developed and empirically tested (Becker and Murphy, 1988); (Chaloupka, 1991). However, these models do not take account of those who underestimate the strength of the addiction or who, for whatever reason fail to appreciate the magnitude of the adverse consequences. Nor do they appropriately confront the difficult question of the social consequences from teenage smoking. These models demonstrate that teenagers tend to disregard the future consequences of smoking more so than adults (Chaloupka, 1991).

be expressed in economic terms as an increase in the transaction cost of smoking, and the transaction cost would vary widely among smokers. Since it is unclear how the slope of the demand curve for cigarettes might shift in response to a nonuniform increase in transaction costs to smokers, a reliable measure of the change in net benefits to smokers cannot be derived.

Based on the foregoing, this study makes no attempt at this time to express the health consequences of H.R. 3434 to smokers themselves in social value terms.

Summary of Costs and Benefits With Reference To A Society With No Smoking Restrictions

This completes the assessment of smoking restrictions using our analytic baseline of a society with no restrictions. The results of this analysis are summarized in Exhibit S-1, and may be interpreted as the costs and benefits of smoking restrictions in a society where no such restrictions exist. This summary analysis forms the basis for estimating the effects that H.R. 3434 would have on current society, which is the subject of the remaining portion of this report.

Cost and Benefits of H.R. 3434 Based on Current Conditions

S-1 summarizes the costs and benefits of smoking restrictions that would occur on a society with no current smoking restrictions. However, to assess the impact of H.R. 3434, the level at which current restrictions already exist must first be assessed.

Baseline Estimate of Compliance

Establishments with Existing Smoking Policies. Many establishments already have some form of smoking policy. The National Survey of Worksite Health Promotion Activities collected information on worksite smoking policies. In 1992, 59% of worksites covering more than 50 employees had a formal smoking policy that either banned smoking, or restricted smoking to separately ventilated areas (DHHS, 1992). This represents a substantial increase since 1985 when only 27% of the worksites reported such policies. Exhibit 7-1 provides data from the 1992 survey (DHHS, 1992). In general, larger worksites were more likely to have such policies than smaller worksites. The 1992 survey covered a wide variety of establishments in the following categories: manufacturing; wholesale and retail; services; transportation, communications, and utilities; finance, insurance, and real estate; and agriculture, mining, and construction establishments.

The Bureau of National Affairs and the Society for Human Resource Management have conducted surveys since 1985 of members of the American Society for Personnel Administration concerning workplace smoking policies. Organizations spanned a wide range of manufacturing and commercial enterprises (BNA, 1986). In 1991, 85% of responding firms had smoking policies designed to address employee health and comfort, up from 5% in 1987 and 36% in 1986. Total bans on smoking existed in 34% of the firms, compared with 7% in 1987 and just 2% in 1986 (BNA, 1991).

Many state and local laws require some form of smoking restriction in different indoor environments, but for the most part, these are not very restrictive. Exhibit 7-2 summarizes 1993 data (unpublished) from the Centers for Disease Control, Office of Smoking and Health on the types of state laws restricting smoking. At the time the data were collected, no states had laws banning smoking in public places or restricting smoking to separately ventilated areas. Since that time, Vermont has passed such a law, and similar laws exist in some local jurisdictions. However, requirements for designated smoking areas (not separately ventilated) in public places exist in 40 of the 53 states and territories, and 31 states or territories have similar restrictions for restaurants.

It is clear from the above that not all entities subject to H.R. 3434 would suffer the full cost burden of compliance. Those that already comply would suffer no burden, and others that partially comply may suffer only a partial burden. These issues are incorporated into the assessment method described below.

Current Compliance Estimates. DHHS (1992) estimated that 59% of working establishments with 50 or more employees have restrictive smoking policies which either ban smoking or restrict it to separately ventilated areas. The BNA survey suggests that 34%

completely ban smoking. Data from these surveys show a clear trend toward the establishment of smoking policies in general, and total smoking bans in particular, among American business enterprises. However, the figures may overstate the proportion of building spaces actually covered by such policies. Coverage is inversely correlated with the size of firms (Exhibit 7-1). The DHHS survey did not include firms under 50 employees. While the BNA survey did not apparently exclude such firms, smaller firms are unlikely to have personnel administrators as those who were surveyed.

DOE (1991) provides data which suggests that 55% of employees in commercial establishments are in buildings with less than 50 employees. Given this, the proportion of employees currently covered by various smoking restrictions under various assumptions about the policies of small firms are estimated. The results are presented in Exhibit 7-3a. For example, there is widespread opinion among those involved in the smoking issue that only a portion of small firms have a formal smoking policy. Lewit (1993) showed that the compliance rate by small establishments (under 50 employees) to a New Jersey law was less than half the compliance rate for larger establishments. If one assumes that 10% of small establishments have smoking policies of the type reported in the DHHS survey, there would be 32% (vs. 59%) of all employees covered with restrictive smoking policies, and 21% (vs. 34%) would be under a smoking ban. The difference (11%) would have smoking allowed in separately ventilated areas. The results only slightly change with alternative assumptions about small firms.

This study therefore assumes that about 32% of employees are covered by restrictive smoking policies that either ban or restrict smoking to a separately ventilated area. This is composed of 21% which completely ban smoking, and 11% which allow smoking only in separately ventilated areas. It is generally believed that most of the survey responses which indicate separate ventilated smoking areas do not meet the stringent separate ventilation requirement of H.R. 3434 (see discussion in Section 2). Assuming that the 10% of employees with ventilated smoking areas is composed of one fifth (2%) with adequate ventilation, 23% (21% + 2%) of all establishments are estimated to already be in compliance with standards comparable to the requirements of H.R. 3434 (Exhibit 7-3a). Using the same distribution of employees covered by bars and lounges, we estimate that about 80% to 90% will be covered by a ban, and 10% to 20% by a lounge after H.R. 3434 is implemented (Exhibit 7-2b). However, as indicated in Section 1, a small portion of those under a smoking ban are likely to be serviced by some form of outdoor smoking shelter. The actual degree of compliance may well be less than this estimate because of the way in which respondents answer questions about their policies. For example, Rigotti (1992) reports that when assessing compliance with a local smoking ordinance in Brookline, MA, self-reported prevalence of smoking policies greatly exceeded that directly observed.

Summary Comparison of Costs and Benefits Of H.R. 3434 Based on Current Conditions

Exhibit S-2 summarizes the estimated costs and benefits of implementing national legislation such as H.R. 3434, using a baseline estimate that 23 percent of the population is already subject to such restrictions. Current levels of cigarette consumption are also used to

assess costs and benefits under this baseline. The following sections provide additional detail of these results.

Costs of Implementing Smoking Restrictions

Policy Implementation and Smoking Lounges

The analysis shows that costs of implementing legislation such as H.R. 3434 appear to be quite low relative to the benefits that would be achieved. Establishments would experience costs of establishing a policy, communicating the policy to employees or clientele, posting signs, assuring compliance, and sometimes offering smoking cessation services. These activities would cost between \$0.1 billion and \$0.4 billion.

The main determinant of cost is the expenditure associated with the construction and maintenance of smoking lounges. Smoking lounges meeting the strict requirements of H.R. 3434 would have to meet stringent standards concerning ventilation and other provisions to insure that the air in the lounge does not enter other parts of the building. In addition, smoking policies involving smoking lounges are generally associated with greater complaints and with lower reported satisfaction than smoking bans, and smoking bans are becoming increasingly popular (Sorensen, *et al.* 1991; 1991a, 1992; Stillman, *et al.* 1991). Finally, the structural features of many existing buildings make it infeasible or cost prohibitive to construct a smoking lounge which would meet the requirements of H.R. 3434. While the extent to which smoking lounges will be relied upon to comply with this legislation is uncertain, for the reasons mentioned above, this analysis estimates that only 10% to 20% of establishments would opt for smoking lounges.

The total cost of implementation by the public and private sector is estimated to be approximately \$0.4 billion (10% smoking lounge) to \$1.4 billion¹⁵ (20% smoking lounge) per year.

Enforcement Costs

Some expenditures by the Federal government and by state and local governments can be expected for information dissemination, though they may well be less than the value of current resources devoted to passing controversial state and local legislation.¹⁶ Costs to building owners for insuring compliance in their building is included in the cost of implementing smoking policies. With respect to enforcement by governmental jurisdictions, H.R. 3434 provides no specific requirements for enforcement of its provisions, other than through citizens suits in federal court. Therefore, enforcement costs are difficult

¹⁵ Includes a higher cost per lounge.

¹⁶ Even when smoking restrictions are passed at the state or local level, campaigns to nullify the legislation or to preempt local legislation with weaker state legislation can involve the expenditure of significant resources on both sides of the issue. No attempt was made to quantify current costs to state and local entities, though national legislation would be expected to reduce many of these costs. For an excellent analysis of this issue as it is manifested in California, see Macdonald and Glantz (1994).

to quantify. Based on an estimate in a proposed rule concerning the distribution of tobacco products to individuals under the age of 18, an estimate of between \$0.1 billion and \$0.4 billion per year appears plausible, and is used in this analysis as the cost of enforcement of legislation comparable to H. R. 3434 under current baseline conditions.

Health Benefits from Reductions in Environmental Tobacco Smoke (ETS)

The Health Consequences of ETS

A major component of the benefits which could be achieved from national legislation that restricts smoking in public places is from reduced exposure of building occupants to ETS.

Exhibit 2-1 presented information on the health consequences of ETS. For the purpose of valuing the benefits resulting from reduced exposure to ETS due to smoking restrictions, several conservative adjustments to these figures were made before making an assessment of the value of benefits resulting from reduced ETS exposure. The reduction in exposure resulting from smoking restrictions comparable to H.R. 3434 is estimated to result in an average reduction of 7,000 to 12,900 premature deaths per year over the first 50 years, and approximately 7,500 to 13,000 per year thereafter. The value of these reductions, when using a "willingness to pay" measure, and discounting future reductions at a rate of 3%, would range between \$33 billion and \$60 billion per year.

To this has been added benefits to be achieved from improved health, mostly to children, including reduced incidence of lower respiratory tract infections, ear infections, and asthma. These benefits are estimated at between \$2 billion and \$5 billion per year, most of which is associated with reduced asthma induction among children. For asthma, this analysis reflects an estimated reduction of between 1,200 and 3,000 cases annually. To value the benefits from reduced asthma induction, we used a willingness to pay measure associated with chronic bronchitis, which is also a chronic respiratory disease.

The total benefit from reduced ETS exposure includes both the benefits of premature deaths avoided plus the benefits of reduced illness. The total benefits due to reduced ETS exposure is thus estimated to be \$35 billion to \$66 billion per year.

Increased Comfort of Building Occupants: This analysis assumes that, all else being equal, no building occupant would prefer being exposed to environmental tobacco smoke, and that most derive benefits from a smoke free environment. With the exception of the health, productivity, and safety effects discussed elsewhere, these benefits are largely intangible, and include such factors as reduced irritation and reduced environmental odor, and less annoyance with tobacco smoke residuals left on hair and clothing. In the present study, no attempt was made to quantify these benefits. However, because the overall results do not include the benefits of increased comfort, and because of the pervasive use of conservative assumptions in this analysis, it is expected that the estimate of total benefits from reduced ETS exposure is conservative.

Savings in the Operation and Maintenance of Buildings

Smoking in a building involves implicit operational and maintenance expenses. In addition to emptying and cleaning ashtrays, the smoke, ashes, and accidental burns on furniture and carpets create an additional housekeeping and general maintenance burden. For example, the BOMA reports that in a tightly monitored program, a member firm experienced a 15% reduction in housekeeping costs when a non-smoking policy was introduced. Maintenance costs were not covered in the monitoring program.

The actual savings in both housekeeping and maintenance expenses are expected to vary from building to building depending upon use (e.g., offices versus retail stores). A separate estimate was therefore developed for different uses. The cost saving estimates were then allocated just to the portions of those buildings for which they would apply.

Finally, it was recognized that the computed savings would not be realized in many buildings. Using survey data to indicate proportions of establishments that experience maintenance savings, the square feet to which savings would apply was decreased by about 40% in most cases.

Taking these factors into account, this analysis estimates that the savings in operating and maintenance costs would amount to about \$4 billion to \$8 billion per year.¹⁷

Effects on Productivity

On-the-Job Productivity Improvements from Reduced ETS. It is generally agreed that ETS reduces the productivity of "individual" building occupants, and that clearly defined and fairly implemented smoking policies will increase "organizational" productivity by reducing potential conflicts between smokers and nonsmokers. While reduced ETS would likely have some positive impact on smoker productivity, the inability to smoke at their work station would likely have the opposite effect.

The ETS effect would *increase* productivity and apply to all employees. However, some smokers would work less effectively and some would spend more time going to and from an allowable smoking area. This may *decrease* productivity, but would apply only to smokers, and only to some proportion of the smoking population. Quantitative estimates of these effects could not be developed for this study.

Benefits from Reduced Absenteeism

After accounting for differences in socioeconomic characteristics between smokers and persons who have never smoked, smokers are estimated to have about 50% more

¹⁷ The housekeeping and maintenance cost savings, when compared to the cost of implementing smoking restrictions, including smoking lounges, suggest that some building owners may be induced to consider implementing smoking restrictions in order to increase profits, even in the absence of smoking restriction legislation.

workdays lost than persons who have never smoked, and former smokers are estimated to have about 30% more workdays lost than never smokers (Manning, *et al.* 1991).

Based on a review of recent studies, it is estimated that between 3% and 6% of current smokers would quit as a result of national legislation that restricts smoking. This would result in an immediate decrease in the number of smokers and an equivalent increase in former smokers. The initiation rate for new smokers is also estimated to decrease by 5% to 10%. This would ultimately result in an equivalent proportional reduction in the number of smokers, and an equivalent absolute increase in the number of persons who have never smoked. The average daily earnings including fringe benefits of smokers is about \$104, and discounting all future effects by 3% yields an estimated savings of under \$0.5 billion per year.

Savings in Smoking-Related Fires

Most smoking-related fire injuries and property losses are in residential environments, which would not be subject to smoking restrictions. As a result, the savings from smoking restrictions would be minimal, and is estimated to be approximately \$0.5 to \$0.7 billion per year. This estimate includes the effect of an estimated reduction in cigarette consumption at home because of quitting and reduced initiation.

Social Benefits or Losses Regarding Smokers

Smoking restrictions comparable to those in H.R. 3434 would be expected to result in some reduction in overall cigarette consumption. Faced with restrictions on where they may smoke, some current smokers may quit and some may reduce overall consumption. In addition, these restrictions would also tend to discourage many nonsmokers, mostly teenagers,¹⁸ from becoming smokers.

These changes in behavior would result in significant improvements to the health of smokers themselves, as well as other benefits such as increased safety and reduced property damage from smoking-related fires. Based on the assumptions used in this analysis, EPA estimates changes in smoking behavior would result in an average of 27,000 to 54,000 fewer premature deaths per year among smokers during the first 50 years, and 47,000 to 92,000 fewer premature deaths per year thereafter.¹⁹ On average, smokers who quit or cut back would add back an average of 5 to 8 years of life otherwise lost to smoking-

¹⁸ CDC (1991).

¹⁹ The difference in death rates each year results from the different time patterns of the effects of quitting and cutting back on consumption, and because the analysis assumed that it would take 60 years reduced annual initiation to complete its effect on the size of the smoking population. Therefore, the 54,000 to 92,000 premature deaths reflect annual rates after 60 years for reduced initiation. In addition, this analysis assumed H.R. 3434 would have only a "one time" effect on decisions to quit, rather than an ongoing effect. Therefore, the H.R. 3434-related quitting eventually disappears as the cohort of smokers motivated to quit by H.R. 3434 dies from old age or other causes.

related premature death. For those nonsmokers who avoid becoming smokers, life is extended by an average of about 15 years.

Clearly, these health benefits to smokers are highly significant. However, for a number of reasons this study does not attempt to interpret the social value of these changes. First, the economic measures traditionally applied to the health consequences of pollution may not be appropriate to use in estimating the social value of physical effects of smoking which occur to smokers themselves. Exposure to pollution, such as ETS, is essentially involuntary and uncompensated. Addiction arguments aside, smoking is a voluntary activity which results in other consequences for smokers, some positive and some negative. These other consequences are not reflected in measures of value for health risk reductions sometimes used by EPA. Applying such health risk valuation factors to health consequences for smokers would therefore inappropriately omit the value of all these other costs and benefits to smokers, resulting in potentially biased measures of the welfare change to society.

Second, analysts disagree whether the traditional economic models one might use to measure the welfare change to smokers can be reasonably applied, particularly given limits on available data. To obtain reasonable estimates of the change in net benefits to smokers, these traditional models require that the subjects, smokers in this case, are acting rationally in response to a free and open marketplace. Furthermore, these consumption decisions must either be devoid of significant price distortions such as taxes and subsidies, or analytical corrections must be made to take account of these distortions. With respect to the rationality requirement, questions have been raised whether the rational consumer choice model applies given the apparent addictive nature of smoking.²⁰ Questions have also been raised whether the consequences of taxes (e.g., cigarette tax) and subsidies (e.g., tobacco farm subsidies, subsidized health care) significantly distort consumer decision making in this case.

Third, EPA is concerned that currently available data are insufficient to support using a traditional economic model to estimate the change in net benefit to smokers caused by H.R. 3434. The reason for this is that H.R. 3434 does not prohibit smoking outright, nor does it change the purchase price or quantity of cigarettes available. Instead, H.R. 3434 only compels changes in the location and/or time pattern of cigarette consumption. This would be expressed in economic terms as an increase in the transaction cost of smoking, and the transaction cost would vary widely among smokers. Since it is unclear how the slope of the demand curve for cigarettes might shift in response to a nonuniform increase in transaction costs to smokers, a reliable measure of the change in net benefits to smokers cannot be decided.

²⁰ Note, however, that some analysts subscribe to models of "rational addiction" which have been developed and empirically tested (Becker and Murphy, 1988); (Chaloupka, 1991). However, these models do not take account of those who underestimate the strength of the addiction or who, for whatever reason fail to appreciate the magnitude of the adverse consequences. Nor do the models appropriately confront the difficult question of the social consequences from teenage smoking. These models demonstrate that teenagers tend to disregard the future consequences of smoking more so than adults (Chaloupka, 1991).

Based on the foregoing, this study makes no attempt at this time to express the health consequences of H.R. 3434 to smokers themselves in social value terms. Future versions of this analysis may make such an attempt if these analytical problems and data limitations are resolved.

Comparing Costs and Benefits of H.R. 3434

Bearing in mind the limitations presented by the current analysis two principal findings emerge from this analysis. First, it is clear that, for those items quantified in this study, the benefits of smoking restrictions comparable to H.R. 3434 substantially outweigh the costs. Second, comparing the high estimate of costs with the low estimate of benefits does not change the fundamental conclusions that benefits significantly exceed costs.

It should be noted that no attempt was made in the current analysis to evaluate the costs and benefits of altering provisions of the legislation. Throughout this analysis, no exception in scope or timing of the provisions of H.R. 3434 were assumed. Clearly, changing provisions such as the scope or timing of the restrictions would affect both costs and benefits.

Comparisons with Alternative Baselines

Given the rapid increase in public and private smoking restrictions in the last few years, and the downward trend in cigarette consumption, it is likely that the future will bring additional restrictions, and consumption may continue to fall without passage of H.R. 3434. Of course, the future is always uncertain, and tobacco consumption and smoking restrictions will be influenced in part by campaigns of tobacco and anti-smoking interests (Samuels and Glantz, 1991, Macdonald and Glantz, 1994).

Alternative scenarios were also constructed which varied the assumption about future baseline consumption of cigarettes. Similar to other major influences such as the national educational campaigns about smoking, national legislation restricting smoking in public buildings may contribute to continued downward trends in cigarette consumption. Alternatively, these downward trends may continue or level off regardless of the advent of such legislation. However, sensitivity analysis indicates that, as in the case of alternative public and private restriction policies, varying the assumed baseline trend in future cigarette consumption has no significant effect on the result that social benefits would be expected to exceed costs by a substantial margin.

Results using alternative baseline scenarios are summarized in Exhibit S-3. A graphic display is presented in the exhibit. The first scenario presents results under an assumption that there are no restrictions currently in place and that per capita consumption of cigarettes remains at current levels. This is the base scenario used to calculate benefits and costs of smoking restrictions. The second scenario differs from the first in that it assumes that 23% of the population is covered by policies which are comparable to those in H.R. 3434. This is the baseline used to assess the impact of H.R. 3434. The third scenario assumes that restrictive smoking policies will continue to be adopted in the public and

private sector without the passage of H.R. 3434, and that these will continue and achieve a level of 75% compliance with standards comparable to requirements of H.R. 3434 in 10 years and remain at that level thereafter. The fourth scenario combines an assumption of 23% existing coverage with an assumption that per capita cigarette consumption will continue to fall for ten years into the future at a 3% per year, and then remain constant after that. The last scenario is the same as the fourth except that per capita cigarette consumption is assumed to fall for 20 years before it levels off.

Under all of the alternative scenarios presented in this analysis, assumptions about the pervasiveness of future restrictions in the absence of H.R. 3434 have virtually no effect on the findings that, for the items quantified in this study, the social benefits would exceed the costs.

A 3% discount rate is used for all scenarios. While the absolute level of estimated costs and benefits are different under each scenario, our qualitative conclusions remain unchanged.

Other Economic Considerations

The estimates of costs and benefits covered in this analysis are a subset of potential economic consequences that policy makers may wish to consider.

Restoration of Lost Income: Implementing smoking restrictive legislation nationally would result in the restoration of approximately \$31,000²¹ for each pre-retirement year of premature death which is avoided because of smokers who quit, cut back, or fail to become smokers because of H.R. 3434. On average, we estimate that each premature death avoided because of quitting and reduced consumption would add approximately 1.4 to 4 salary earning years, and each premature death avoided from persons who refrain from becoming smokers would add approximately 11 salary earning years of life.²² When future values are discounted at 3%, this analysis estimates that between \$3 billion and \$6 billion of lost income would be restored. A similar estimate was not possible for persons exposed to ETS, though this effect should be considered. The importance of this impact is enhanced to the extent that some children, spouses, the elderly or disabled may be dependent on such income.

Reduced Burden on the Medical Service Industry: Every year, the average expenditure for medical services for smokers and former smokers exceeds that of nonsmokers. However, this is partially offset by the fact that nonsmokers live longer, and continue to consume medical services during the extra years of life. When both of these factors are taken into account, the result is a net excess burden on the medical service

²¹ The estimated annual earnings of smokers is inflated by 20% to account for earnings after the age of 65, based on OTA (1993).

²² Salary earning years are assumed to be years prior to the age of 65.

industry of about \$35 billion per year due to smoking.²³ Assuming that changes in the excess medical expenditures due to smoking restrictions would be proportional to changes in smoking-related premature deaths, this analysis estimates that every reduction in annual premature death would represent an annual reduction of \$85,000 for medical services. Accordingly, when future savings are discounted at 3%, H.R. 3434 would reduce annual expenditures for medical services by \$2.3 billion to \$4.7 billion per year. It is not clear from our analysis what net impact reduced exposure to ETS would have on the medical service industry.

Potential Cost to Social Security and other Pension Funds: Persons who would otherwise have died prematurely would live longer under smoking restrictions and collect pensions and social security during those extended years. Each premature death avoided for smokers who quit, cut back, or fail to initiate smoking represents an extension of life of about 5 to 7 years beyond the age of 65, during which time they would be eligible to collect a pension annuity. Data are not currently available to support a similar estimate for ETS exposed individuals.

Reduced Revenues from Cigarette Sales and Excise Taxes: Implementation of national legislation to restrict smoking in public buildings would reduce overall cigarette consumption by approximately 11% to 17%, and this impact would occur within the first few years of implementation. This would result in a corresponding reduction in cigarette tax revenues.²⁴ However, these could be offset, to some extent, by the social benefits of alternative agricultural production or other taxable uses of farmland.

Employment Dislocations: Reductions in demand for cigarettes and medical services would involve some temporary dislocations of persons employed in these industries.

Conclusions

Given data limitations, and the uncertainties inherent in cost-benefit analysis of public health and environmental policies, this analysis does not purport to provide definitive conclusions about the overall merits of national smoking restriction legislation. Nevertheless, while recognizing that several effects of H.R. 3434 including effects on productivity, comfort from reduced exposure to ETS, and the net losses or gains regarding smokers, were not quantified, this analysis demonstrates that, for those items that were quantified, the estimated benefits of H.R. 3434 exceed the estimated costs by a substantial amount. This analysis suggests that the net effect of these excluded items would have to represent a loss exceed \$39 billion to \$72 billion per year for costs to exceed benefits.

As suggested in Exhibit S-4, the overall findings of substantial net benefits are not altered by comparing high costs to low benefits, or by alternative discount rates. Furthermore, while the magnitude of the net benefits specifically allocated to H. R. 3434 is dependent on one's assumptions about baseline conditions, these assumptions go more to the question of whether or not to capture these net benefits through national legislation or by other public and/or private initiatives.

²³ This is estimated from information provided by Hodgson (1992) who compares excess medical costs over the lifetime of persons who have ever smoked, and persons who have never smoked. Similar data and procedures were also used by Manning, *et al.* (1991).

²⁴ For an excellent comparison of what smokers pay in excise taxes, medical expenditures, and contribution to retirement funds, relative to the value of the services they receive for those payments, see Manning, *et al.* (1991). However, the net monetary payments made by or to smokers is not a useful index for measuring the overall social benefits or costs of smoking restrictions. As previously described, willingness to pay measures are more appropriate. Also, our costs and benefits do not count transfers of costs or benefits from one group in society to others.

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Exhibit 1-1: Policy Development and Implementation Costs (1000 Employees)
Base-No Restrictions

Initial Cost	Units	Cost/Unit [1]	Number of Units		Cost (\$)	
			Low	High	Low	High
Policy Development						
Managerial Personnel	hours	20.00	6	10	100	200
Legal Personnel	hours	21.00	2	8	42	168
Administrative Personnel	hours	12.00	15	25	180	300
Total [2]					322	668
Policy Distribution						
Printing	pages	0.05	1,000	2,000	50	100
Administrative Personnel	hours	12.00	4	6	48	66
Total					66	166
Policy Implementation						
No Smoking Signs [3]	signs	25.00	20	30	500	750
Maintenance Personnel	hours	16.00	4	6	64	96
Total					564	846
Outdoor Recreational [4]						
Maintenance Personnel	receptacle	130.00	5	10	650	1,300
Total	hours	16.00	3	6	40	66
					690	1,366
Smoking Cessation [5]	participants	75.00	36	50	2,619	3,750
Total Initial Cost					4,457	9,666

Annual Cost	Units	Cost/Unit [1]	Number of Units		Cost (\$)	
			Low	High	Low	High
Policy Maintenance						
Compliance	hours	20	10	30	200	600
	hours	12	15	100	180	1,200
Other						
Managerial	hours	20	3	6	60	120
Other	hours	12	5	10	60	120
Maintenance Personnel	hours	16	3	6	52	66
Total Annual Cost					552	2,136

1. Unit labor costs are approximated using BLS Median Weekly Earnings inflated by 2.4% to account for fringe benefits. Maintenance labor hours are estimated using Means Building Cost Data and the Engineering Performance Standards, Janitrol Handbook.
2. Five responses to limited survey suggest a cost range of \$50 to \$200, median = \$100. Size of firms in whole survey ranged from 30 to 1600 employees; median = 240 and mean = 512 (Levit, 1984).
3. No smoking signs in Geisinger, 1992 are \$10.00. The 925 figure is from Levitt, 1994, who also suggests a median cost of about \$200 based on company responses.
4. The cost of outdoor receptacles is from Geisinger, 1992. However, Levitt (1994) suggests that outdoor receptacle at entrance cost \$88 each, with total costs for firms ranging from \$25 to \$1200.
5. Assume 25% of employees are smokers, and that 10% (low) and 20% (high) will participate in such programs directly as a result of instituting smoking restrictions, but that this will be a one time increase in participation.

Exhibit 1-2: Cost of Implementing Smoking Bans

Base—No Restrictions

	Cost per 1000 Emp.	Employees (millions)	Total Cost (million)	Recurrent Portion	Amortized Portion [1]	Total Annual
Low Estimate						
Initial Cost	\$4,487	110	494	74	26	99
Annual Policy Maintenance	\$652	110	61			61
Total						159
High Estimate						
Initial Cost	\$8,858	110	754	113	38	151
Policy Maintenance	\$2,136	110	236			236
10% with Outdoor Shelter						69
Total						455

1. Annualized capital cost without time limit is equivalent to borrowing funds and paying the interest every year, but not the principal. For convenience, a single discount (interest) rate of 5% is used for these calculations.

2. Figure is for 6% discount (interest) rate (see Exhibit 1-4)

Exhibit 1-2a: National Cost of Indoor Lounges

Base—No Restrictions

	Total Annual Cost			5%		7%	
	Low Estimate (\$ million)	High Estimate (\$ million)		Low Estimate (\$ million)	High Estimate (\$ million)	Low Estimate (\$ million)	High Estimate (\$ million)
All with Lounges	3,608	4,562		3,676	4,638	3,641	4,733
10% w Lounges	351			358		364	
20% w Lounges		812			830		847

Exhibit 1-3: Smoking Lounge Design (100 smokers)

Average	Peak	Square Feet Per Lounge Occup.
Lounge Density (ASHRAE, 1989)		200
Smokers Served by Lounge		
Time Frame		
Smokers per Hour	100 Smokers	
Break time per smoker	2 hours	
Expected Lounge Occupancy	50 smokers	
Construction Requirements per	12 minutes	
Smoking Occupant Served	10 smokers	
	15 smokers	
		2

Exhibit 1-4: Cost of Building Smoking Lounges
Base-Case Restrictions

	Persons (million)	Square Feet per Occupant	Initial Cost per Square Foot	Total Cost (\$ million)	Recurrent Portion (20%)	Amortized Portion	Amortized Annual Cost (\$ million)	Cost per Sq. Ft.	Annual Cost (\$ million)	Total Annual Cost	
										Low Estimate (\$ million)	High Est. (1) (\$ million)
Smokers	46										
Smoking Occupants	66										
Occupants serviced	66										
Indoor Lounges	66	8	30	3200	640	98	759	28	8760	3809	4682
2% Discount						185	825			3575	4646
7% Discount						231	881			3641	4733
Outdoor Lounges	6.60	2	25	275	55	6	63			63	137
2% Discount						14	98			66	136
7% Discount						18	74			74	149

1. High estimate is 30% higher than low estimate (see text) for indoor lounges, and 100% higher for outdoor lounges based on Low estimate.

Exhibit 1-5: Total National Implementation (with Smoking Lounge) and Enforcement Costs

Base-Case Restrictions

	3%		5%		7%	
	Low Estimate	High Estimate	Low Estimate	High Estimate	Low Estimate	High Estimate
Implementation (with Smoking Lounge)	810	1,367			524	1,401
Enforcement	100	800	617	1,384	100	800
Total	910	1,867	617	1,684	624	1,801

Exhibit 2-1a: Estimates of U.S. Nonsmoker Annual Mortality Associated With Exposure to Other People's Smoke

MORTALITY	U.S. EPA ^{1,2}	CENTERS FOR DISEASE CONTROL ³	OTHERS	COMMENTS
Lung Cancer (ICD 162-183)	3,000 Total	3,800 ⁴	12 ⁴ , 240 to 2000 ⁵	ETS a Group A carcinogen. ETS concentrations similar in smoldering homes and offices. Generally higher in restaurants.
Home ETS sources	800	-	3000 ⁴ , 3000 ⁵ , 5000 ⁶	
Other ETS sources	2,200	-	4000 ⁶	
Other Cancers	b		11,000-12,000 ^{1,14}	Limited evidence for cancers other than lung
Heart Disease (410-414)			32,000-40,000 ^{1,14,11}	Evidence continues to mount on ETS and heart disease
Burn Deaths		1,500 ¹⁶	1200 ¹¹ , 150 ^{17a}	Due to fires initiated by smoldering materials
Spontaneous Abortions			145,000 ¹⁴	
Sudden Infant Death Syndrome	a	700	1,800 ¹⁴	
Respiratory Conditions, newborn (78b-78d)		2,000	4,400 ^{14,16}	Estimates are based on maternal smoking
Short Gestation, Low Birthweight (785)		800	4,400 ^{14,16}	

*EPA¹ evaluated only the respiratory hazards of ETS; also, was the only source to breakdown home vs. nonhome risks.

¹⁴Quiescent to children under age 18.

¹⁵EPA¹ concluded that maternal smoking is a strong risk factor for SIDS. ETS exposure to the newborn is also considered to be a risk factor for SIDS.

¹⁶Gained by difference as perinatal deaths, which includes stillbirths.

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Exhibit 2-1b: Estimates of ETs-Attributable Morbidity in Children Due to Home and Nonhome Sources

	MORBIDITY*		HOME		NONHOME
	U.S. EPA†	QFracza††	U.S. EPA†	QFracza††	
Low Birth Weight (≤2500g)			68,000 ^b		
Admission to Neonatal Intensive Care Units			26,000 ^{b,c}		30,000 ^b
Operations on Torus or Adenoids			27,000 ^b		180,000 ^b
Tympanostomy Operations ^d			138,000		2,800,000 ^b
Epidemics of Otitis Media			2,308,000		100,000 - 300,000 ^b
Asthma Exacerbation			300,000 - 700,000	638,000 ^b	1,000 - 6,000 ^{b,e}
Asthma Induction			12,000 - 40,000 ^b		3,400,000 ^b
Physician Visits for Cough				2,178,000 ^b	15,000 - 30,000 ^{b,f}
Lower Respiratory Tract Infections (Pneumonia, Bronchitis, Bronchiolitis)			135,000 - 270,000 ^b	885,000 - 1,138,000	
Fire-Related Injuries				369 ^b	

*Age < 18 years, unless noted otherwise

†From national smoking during pregnancy

††QFracza provides cost estimates of 302 m - 773 m \$

*Age < 15 years

*Age < 15 years

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*Age < 15 years, unless noted otherwise

†From national smoking during pregnancy

††QFracza provides cost estimates of 302 m - 773 m \$

*Age < 15 years

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Exhibit 2-1e Recent studies of heart disease among ETS exposed persons who never smoked

Study	Design	Exposure definition	Relative risk	Comment
Update of Gille et al. [1964] by Hole et al. [1969]† 1972-76	12-yr followup, 3,860 men and 4,037 women aged 45-64 in 1972-76	Living with smoker or ex-smoker in early 1970s	2.01 (CI, 1.21-3.38)	Adjusted for cardiovascular risk factors, positive dose response
Humble et al. [1960] aged 40+	20-yr followup, 513 women	Living with smoker in 1960	1.59 (CI, 0.99-2.57)	Adjusted for cardiovascular risk factors, dose response in some strata
Helsing et al. [1968] 14,873 women, aged 25+ in 1963	12-yr followup, 4,162 men and 1963	Living with smoker or ex-smoker in observed Women: 1.24 (CI, 1.1-1.4; 1,539 observed)	Men: 1.31/Adjusted for education, (CI, 1.1-1.5; 462 positive dose response among women only)	
Svensden et al. [1965, 1967] men aged 35-57 in 1973-82	7-yr average followup, 10,245	Married to smoker or ex-smoker	1.61 (CI, 0.96-2.71)	Adjusted for cardiovascular risk factors, positive dose response
Garland et al. [1965] aged 50-79 in 1972-74	10-yr followup, 665 women	Married to smoker or ex-smoker	2.9 (estimate/Adjusted for age 18 observed)	
Miyama [1964] aged 40+	16-yr followup, 91,940 women	Married to smoker or ex-smoker 0.91- 1.33 High exposure: 1.31 (90% CI, 1.06-1.60; 494 observed)	Low exposure: Significant dose 1.10 (90% CI, response)	
Lee et al. [1966]	48 cases, 182 controls	Married to smoker or ex-smoker	Men: 1.24/No apparent dose Woman: 0.90 response	

* Confidence interval is 90% unless otherwise indicated.

† Hole et al. [1969] provide updated results of the same population studied by Gille et al. [1964].

§ Serum cholesterol, blood pressure, and body mass index.

** Svensden et al. [1967] is the full report of the abstract published by Svensden et al. [1965].

As referenced in: NIOSH: Current Intelligence Bulletin 54, June 1991.

Exhibit 2-2: Proportional Reduction in Mortality Ratio (PRMR) By Years Since ETS Exposure

Years Quit	PRMR		Overall
	Cancer	Heart Disease	
<1	22.40		
1 to 4	18.80	10%	66%
5 to 9	7.70	60%	77%
10 to 14			68%
15 to 19	4.70	79%	80%
20 to 24	4.80	76%	81%
25+	2.10	81%	90%
			100%

1. Cancer mortality ratio for male smokers (DHHS 1989).
2. Heart disease mortality ratio assumed to decline twice as fast as the cancer mortality ratio.
3. Average of cancer and heart disease weighted by the average proportion of cancer and heart disease deaths between high and low estimates.

Exhibit 2-3: Percent Reduction Smoking Population and in Total Consumption due to Smoking Restrictions
Reductions From Quitting, Reduced Initiation, and a Reduced Consumption Rate of Smokers

Base=No Restrictions

	Total Reduced Consumption	
	Quitting & Reduced Initiation [1]	Reduced Cons. Rate [2] (50 yr. av)
Annual Average Reduction:		
Low Estimate	4.24%	9.58%
High Estimate	8.48%	13.73%
		22.20%

1. Proportional reductions in consumption due to quitting and reduced initiation is assumed to be equivalent to the reductions in smokers due to quitting and reduced initiation. Since the population changes are relatively constant over time from these combined effects, the results would not be affected greatly by alternative discount rates.
2. This is the proportional reduction in cigarette consumption due to the reduced consumption rate of the smoking population remaining after quitting and reduced initiation is taken into account.

Exhibit 2-4: Premature Deaths Avoided from Reduced Exposure to Environmental Tobacco Smoke **Base-No Restrictions**

	Annual ETS Related Deaths				60 Year Total Premature Deaths Avoided Estimates			
	Low Estimate		High Estimate		Low Estimate		High Estimate	
	Home	Non-Home	Home	Non-Home	Home	Non-Home	Home	Non-Home
Major Diseases								
Heart Disease Deaths (1)	3,240	8,760	8,480	17,520				
Cancer Deaths (2)	600	2,200	600	2,200				
Total	4,040	10,960	7,280	19,720				
Yearly Average for 60 Year Period					7,818	450,430	26,178	810,445
					15.6	9,009	56.4	19,209
								19,772

1. Heart disease death rates for ETS are conservatively adjusted from the Base-No Restr. The estimates are allocated between home and nonhome in the same proportion as long term cancer.
2. Lung cancer for home and nonhome exposures is from EPA (1983).
3. Home exposures effects result from decreases in tobacco use from quitting and reduced initiation. Reductions in smoking due to decreased cigarette consumption by smokers is assumed to take place outside the home and are therefore not included. The time delay in premature deaths avoided results by assuming that the reduction in the mortality rate for cancer over time follows the same time pattern as the mortality rate for a smoker who quits. The reduction over time for heart disease is assumed to occur twice as fast as for cancer (see calculations in Exhibit 2-5).
4. Impacts of smoking restrictions are calculated to be 90% of nonhome exposure (see text).

Exhibit 2-5: Morbidity Effects from Reductions in ETS Exposure **Base-No Restrictions**

	Base Level (1980) Annual Incidence Rates				Estimated Annual Reductions			
	Low Estimate		High Estimate		Low Estimate		High Estimate	
	Home	Non-Home	Home	Non-Home	Home (1)	Non-Home (2)	Home (1)	Non-Home (2)
Morbidity Effects								
Tonsils and Adenoids Operations	30,000	30,000			27,000	27,000	27,000	27,000
Tympanotomy Operations	160,000	160,000			144,000	144,000	144,000	144,000
Ear Infection Episodes	2,800,000	2,800,000			2,520,000	2,520,000	2,520,000	2,520,000
Asthma Exacerbation	300,000	100,000	700,000	300,000	12,714	90,000	59,331	270,000
Asthma Induction	12,000	1,000	40,000	5,000	509	900	3,360	4,500
Physicians Visits for Cough	2,176,000	3,400,000	2,176,000	3,400,000	92,217	3,040,000	184,434	3,040,000
Lower Respiratory Tract Infections	135,000	15,000	270,000	30,000	5,721	13,500	22,895	27,000
								49,888

1. Estimates based on reduction in cigarette consumption due to smokers quitting, and reduced initiation of new smokers. See Exhibit 2.
2. Reductions due to reduced consumption of smokers are not included because these are assumed to take place out of the home.
3. Reductions are assumed to be immediate, without time delay.
4. 90% reduction (see text).

Exhibit 3-1: Unit Costs for Housekeeping and Maintenance

Task by building	Duration (minutes) [1]	Cost Per Hour [2]	Cost Per Task [3]	Annual Frequency		Per 1,000 Square Feet		Annual Cost
				Smoking [4]	No Smoking [5]	Smoking [3] x [4]	No Smoking [3] x [5]	
Housekeeping:								
Empty and damp wipe ashtrays	2.5	\$8.39	\$0.35	250	0	\$87.50	\$0.00	\$87.50
Dusting Desktops	2.2	\$8.39	\$0.31	250	52	\$77.50	\$16.12	\$93.62
High Dusting	4.5	\$8.39	\$0.63	52	12	\$32.78	\$7.56	\$40.34
Venation/Horizontal Blinds	2	\$8.39	\$0.28	6	1	\$1.68	\$0.28	\$1.96
Clean HVAC Vents	10	\$8.39	\$1.40	4	1	\$5.60	\$1.40	\$7.00
Empty and damp wipe ashtrays (per seat for smokers)	0.25	\$8.39	\$0.03	2190	0	\$85.70	\$0.00	\$85.70
Sweeping/Vacuuming	10.0	\$8.39	\$1.40	78	52	\$108.20	\$72.80	\$181.00
General Cleaning for a Smoking Room (Lodging)	30	\$8.39	\$4.20	292		\$1,226.40		\$1,226.40
General Cleaning for a Non Smoking Room (Lodging)	24	\$8.39	\$3.36		292		\$981.12	\$981.12
Empty and damp wipe ashtray stands	4	\$8.39	\$0.56	292	0	\$163.52	\$0.00	\$163.52
Empty and damp wipe ashtrays (per smok	0.25	\$8.39	\$0.03	730	0	\$21.90	\$0.00	\$21.90
Sweeping (per hospital bed for smokers)	5.0	\$8.39	\$0.70	547.5	385	\$383.25	\$255.50	\$638.75
Maintenance/Repair/Replacement:								
Replace Office Furniture			\$4,530	0.2	0.14	\$906.00	\$634.20	\$1,540.20
Carpet Repairs			\$100	1	0	\$100.00	\$0.00	\$100.00
Computer Maintenance (per computer for smokers)	120	\$85.00	\$170	0.5		\$85.00	\$63.75	\$148.75
Computer Maintenance (per computer for nonsmokers)	90	\$85.00	\$128		0.5		\$63.75	\$63.75
Computer Keyboard Replacement (per computer for smokers)			\$50.00	0.67	0.5	\$33.50	\$25.00	\$58.50
Painting			\$1,739.78	0.2	0.2	\$347.96	\$347.96	\$695.92
Replace Table and/or chair (Food Service, per seat)	6800	\$15.35	\$448	0.2	0.14	\$89.50	\$62.85	\$152.35
Replace Furniture (Lodging, per room)			\$2,125.00	0.2	0.14	\$425.00	\$297.50	\$722.50

[1] Source: Means Facility Maintenance Standards, BOMA Office Building Cleaning Operations in North America, DOA 1981.

[2] Source: Average Hourly Wage Rate Plus Fringe, Bureau of Labor Statistics, Means Square Foot Costs, 1981

[4] and [5]: Source: Various sources, see Appendix for full listing. For housekeeping, Dringier 1984, Weiss 1985, Best Western 1984, Kallher 1987. For maintenance, Weiss 1985, Ledger 1994 (computer maintenance and replacement).

Exhibit 3-2: National Savings In Housekeeping and Maintenance Costs

	Total Square Feet (million sq. ft.) [1]	Potential Savings Per 1,000 Sq. Ft. Or Per Unit [2]	Applicable Sq. Ft. [3]	Annual Savings (millions of dollars) [4]	
				Low	High
Office					
Housekeeping	11,802	\$181.24	7,081	\$1,283	\$1,283
Maintenance	11,802	\$547.03	7,081	\$863	\$2,793
Total Savings				\$2,146	\$5,077
Total Savings per Sq. Ft.				\$0.18	\$0.43
Mercantile & Service					
Housekeeping	13,157	\$236.32	3,158	\$748	\$748
Maintenance	13,157	\$204.39	3,158	\$195	\$481
Total Savings				\$911	\$1,227
Total Savings per Sq. Ft.				\$0.07	\$0.09
Food Service					
Housekeeping	1,167	\$86.70	700	\$438	\$438
Maintenance	1,167	\$123.84	700	\$128	\$309
Total Savings				\$585	\$744
Total Savings per Seating Capacity (unmolding)				\$84.84	\$111.06
Health Care					
Housekeeping	2,064	\$333.34	507	\$228	\$228
Maintenance	2,064	\$502.28	507	\$33	\$222
Total Savings				\$261	\$448
Total Savings per Sq. Ft.				\$0.13	\$0.22
Assembly					
Housekeeping	6,838	\$230.32	821	\$194	\$194
Maintenance	6,838	\$204.39	821	\$43	\$125
Total Savings				\$237	\$319
Total Savings per Sq. Ft.				\$0.03	\$0.05
Education					
Housekeeping	8,148	\$394.04	800	\$180	\$180
Maintenance	8,148	\$502.28	800	\$0	\$301
Total Savings				\$180	\$481
Total Savings per Sq. Ft.				\$0.02	\$0.09

Exhibit 3-2: National Savings in Housekeeping and Maintenance Costs
continued

	Total Square Feet (million sq. ft.) (1)	Potential Savings Per 1,000 Sq. Ft. Or Per Unit (2)	Applicable Sq. Ft. (3)	Annual Savings (millions of dollars) (4)	
				Low	High
Lodging					
Housekeeping	3,476	\$373.03	342.6	\$44	\$364
Maintenance	3,476	\$487.88	342.6	\$48	\$351
Total Savings				\$93	\$745
Total Savings per Guest Room (smoking)	[6]			\$73.68	\$589.84
Warehouses/Industrial					
Housekeeping	12,283	\$306.14	7,351	\$781	\$896
Maintenance	12,283	\$0.00	7,351	\$0	\$0
Total Savings				\$781	\$896
Total Savings per Sq. Ft.				\$0.06	\$0.08
Total Savings					
Housekeeping	56,895		20,581	\$3,874	\$4,396
Maintenance				\$1,280	\$5,620
Total Savings				\$5,154	\$10,017
Total Savings per Sq. Ft.				\$0.09	\$0.17

(1) Total Square Feet per building use is from Department of Energy, Energy Information Administration, Commercial Building Characteristics, 1980, page 17.

(2) See Appendix for detailed calculations.

(3) Proportion of Square Footage is report savings. May vary by facility. See Exhibit 18-1 for square foot in secondary education. Statistical Abstract for number of personnel completed. Based 1980 for reported savings.

(4) See Appendix for detailed calculations.

(5) Units for Food Service establishments are eating capacity for students.

(6) Units for Lodging are square feet for common areas and per guest room for ensembles.

Exhibit 4-1: Excess Absenteeism of Smokers and Former Smokers

	Annual Days	Excess Days	Days Saved
Smokers	4.50	1.50	
Former Smokers	3.90	0.90	
Never Smokers	3.00		
Quitting			0.60
Failure to Initiate			1.50

1. Quitters go from smoking to former smoking status
2. Those that fail to initiate smoking go from a potential smoker to a never smoker

Exhibit 4-2: Value of Reduced Absenteeism

Base=No Restrictions			
Days Saved Per Person Per Year	Unemployment Factor	Net Days Saved Per Person	Average Daily Earnings Per Person
0.60	0.04	0.576	104.00
1.50	0.04	1.44	104.00
Quitting			59.90
Fail to Initiate			149.76

Exhibit 4-3: National Annual Savings from Reduced Absenteeism [1]

Base=No Restrictions							
		3%		5%		7%	
		Low Estimate	High Estimate	Low Estimate	High Estimate	Low Estimate	High Estimate
		millions	millions	millions	millions	millions	millions
Quitting		63	107	67	133	73	147
Fail to Initiate		170	340	121	241	93	186
Total		223	447	187	375	166	333

1. Detailed discounting is necessary to separate out the differential effect of quitting and reduced initiation. See Appendix B for discount calculations.

Exhibit B-1: Average Annual Fire Related Injuries and Property Damage (1988-1990)

Base-Case Restrictions

	Residential [1]		Unit Cost [2]		Total Unit Cost		Total Cost	
	Residential	Non-Residential	(million)	(million)	(million)	(million)	Residential	Non-Residential
Injuries								
Fatal	1,328	38						
Non-Fatal	3,325	318	0.17	4.6	6,373	184	6,557	
Total	4,653	356			6,373	184	6,557	
Property Loss [1]	111,600	38,800						
Total Cost							7,238	881

- From letter (1992). Figures are an average of 1988-1990. Figures for 1991 are included because of diversion due to the Oakland fire storm.
- Number of fires.
- Average cost per injury from Ray (1992). Estimates include medical costs, transport costs, lost earnings, legal and health insurance administrative costs, and pain and suffering.
- The unit cost for hospitalized injuries only is \$78 million (Ray, 1992).
- Total Value of each reduced fire-related liability is assumed to be \$4.8 million. See text.

Exhibit B-2: Fire Related Premature Deaths, Injuries, and Property Losses Avoided

Base-Case Restrictions

	Low Estimate			High Estimate			Mid. Reductions Over 80 Yrs		
	Current Annual Average Injuries			Annual Reductions in Injuries			Annual Reductions in Injuries		
	Residential	Non-Residential	Total	Residential [1]	Non-Residential [2]	Total	Residential	Non-Residential	Total
Injuries									
Fatal	1,328	38	68	32	89	113	31	149	180
Non-Fatal	3,325	318	141	274	418	282	281	803	1,084
Total	4,653	356	197	307	507	814	312	952	1,264

- Reductions are assumed to be proportional to reductions in the total consumption of cigarettes due to quitting and reduced taxation. Since the reduction in consumption of cigarettes likely takes place solely outside the home, these reductions are not included in the calculations.
- Uses a 50% reduction for the estimated portion of the nonresidential environments that use smoking, and 60% reduction for the estimated portion that provide smoking lounges. For cooling purposes, the proportion of establishments with indoor lounges in the low estimate is less than in the high estimate. Therefore, the low estimates for the related deaths and injuries avoided is higher than the high estimate because of this offset.

Exhibit B-3: Annual Benefits in Fire Related Injuries and Property Damage

Base-Case Restrictions

	Low Estimate			High Estimate		
	Residential	Non-Residential	Total	Residential	Non-Residential	Total
Injuries						
Fatal	270	158	428	640	161	801
Non-Fatal	23	45	68	47	43	90
Total	293	203	496	687	204	891
Property Loss	13	98	111	27	84	111
Total Savings	307	301	608	714	288	1,002

**Exhibit 6-1: Estimating the Effect of Smoking Restrictions on Quit Rates,
Consumption Rates, and Rates of Initiation**
Base=No Restrictions

Quit Site Conditions	Reference	Quit Rate Reported (Annual)	Assumed Relapse Rate	Net Quit Rate	Net Quit Rate w/o Smoke Restr.	Net Quit Rate due to Smoking Restr.
N-B	Balle, et al.(1991)	15%	30%	10.50%	2.50%	8.00%
	Hudnield, et al.(1990)	9%	30%	6.30%	2.50%	3.80%
	Slane, et al.(1991)	17%	30%	11.90%	7.50%	4.40%
	Stillman, et al.(1990)	15%	30%	10.50%	2.50%	8.00%
N-R or R-B	Andrews (1983)	16%	30%	11.20%	2.50%	8.70%
	Borland et al. (1990)	9%	30%	6.30%	2.50%	3.80%
	Gottlieb et al. (1990)	13%	30%	9.10%	2.50%	6.60%
	Sorensen et al. (1993)	12%	30%	8.40%	2.50%	5.90%
Estimated Net Quit Rate due to workplace smoking policies						
Estimated Net Quit Rate due to Comprehensive Legislation [2]						
					Low	High
					4%	8%
					3%	6%

Consumption	Consumption Reduction	Estimated Reduction in Consumption Rate due to Workplace Restrictions	Estimated Reduction in Consumption Rate due to Comprehensive Legislation [2]
N-B	Slane et al. (1991)	34%	
	Stillman, et al.(1990)	20%	
R-B	Borland et al. (1993)	18%	
	Hocking et al. (1991)	20%	
Estimated Reduction in Consumption Rate due to Workplace Restrictions			
Estimated Reduction in Consumption Rate due to Comprehensive Legislation [2]			
		Low	High
		18%	20%
		10%	15%

Initiation	Reduced Initiation	Estimated Reduction in Initiation Rate due to Comprehensive Legislation
N-B	Woodruff et al. (1993)	38% [3]
R-B	Wasserman et al.(1991)	41% [4]
Estimated Reduction in Initiation Rate due to Comprehensive Legislation		
		Low [5]
		5%
		High [6]
		10%

1. N-B refers to sites that go from no restrictions (N) to a ban (B). R-B refers to sites that go from partial restrictions (R) to a ban (B).
2. Because only about 60% of the population is employed, comprehensive legislation would have less average effect on the whole population than the effect of workplace policies on employees.
3. Cross sectional analysis of California workforces.
4. Not a workplace study. The 41% reduction refers to the difference between teenagers who live in communities with legislation mandating law restrictions in public places, compared with teenagers living in communities with comprehensive legislation, including legislation restricting smoking in workplaces. Most of the reduced consumption is attributed to reduced initiation.
5. Estimate is both conservative and exceptionally uncertain because of the paucity of information.

Exhibit 6-2: Proportional Reduction in Mortality Ratio (PRMR) By Years Since Quitting

Age	Smoker Mortality Ratio [1] Base = 1.00	Ratio to Base Mortality Rate											
		Years Quit:											
		1 to 2	3 to 5	6 to 10	1 to 10 [2]	11 to 15	16 +	11 to 20 [3]	21 to 30 [4]	31 to 40 [4]	41 to 50 [4]	50 + [4]	
0-34					51%	64%	64%						
5-44					51%	64%	64%						
5-54	3.02	42%	43%	59%	51%	64%	64%	64%	90%	95%	95%	100%	
5-64	2.92	26%	30%	45%	36%	55%	61%	58%	90%	95%	95%	100%	
5-74	2.67	11%	26%	27%	23%	39%	59%	49%	80%	90%	90%	100%	
75+	1.85	19%	19%	17%	18%	2%	32%	17%	70%	85%	85%	100%	

1. Males only. Average of mortality rates for above and below 20 cigarettes per day.
2. Weighted average of 1-2, 3-6, and 6-10 years. Ages 30-44 assumed to be the same as 45-54.
3. Average of 11-15, and 16 + years.
4. Assumed to reach 90% average reduction after 20 years based on cancer rate mortality ratios (DHHS 1980), and full reduction (100%) in 50 years with a slight lag for ages older than 65.

Source: DHHS (1980), Table 7, page 66.

Exhibit 6-3: Premature Deaths Avoided (PDA) From Quitting by Years of Abstinence

Age		1990	1991 to 2000	2001 to 2010	2011 to 2020	2021 to 2030	2031 to 2040	2041 to 2050	2051 to 2060	2061 to 2070	2071 to 2080	2081 to 2090	2091 to 2100	2101 to 2110	2111 to 2120	2121 to 2130	2131 to 2140	2141 to 2150	2151 to 2160	2161 to 2170	2171 to 2180	2181 to 2190	2191 to 2200	2201 to 2210	2211 to 2220	2221 to 2230	2231 to 2240	2241 to 2250	2251 to 2260	2261 to 2270	2271 to 2280	2281 to 2290	2291 to 2300	2301 to 2310	2311 to 2320	2321 to 2330	2331 to 2340	2341 to 2350	2351 to 2360	2361 to 2370	2371 to 2380	2381 to 2390	2391 to 2400	2401 to 2410	2411 to 2420	2421 to 2430	2431 to 2440	2441 to 2450	2451 to 2460	2461 to 2470	2471 to 2480	2481 to 2490	2491 to 2500	2501 to 2510	2511 to 2520	2521 to 2530	2531 to 2540	2541 to 2550	2551 to 2560	2561 to 2570	2571 to 2580	2581 to 2590	2591 to 2600	2601 to 2610	2611 to 2620	2621 to 2630	2631 to 2640	2641 to 2650	2651 to 2660	2661 to 2670	2671 to 2680	2681 to 2690	2691 to 2700	2701 to 2710	2711 to 2720	2721 to 2730	2731 to 2740	2741 to 2750	2751 to 2760	2761 to 2770	2771 to 2780	2781 to 2790	2791 to 2800	2801 to 2810	2811 to 2820	2821 to 2830	2831 to 2840	2841 to 2850	2851 to 2860	2861 to 2870	2871 to 2880	2881 to 2890	2891 to 2900	2901 to 2910	2911 to 2920	2921 to 2930	2931 to 2940	2941 to 2950	2951 to 2960	2961 to 2970	2971 to 2980	2981 to 2990	2991 to 3000	3001 to 3010	3011 to 3020	3021 to 3030	3031 to 3040	3041 to 3050	3051 to 3060	3061 to 3070	3071 to 3080	3081 to 3090	3091 to 3100	3101 to 3110	3111 to 3120	3121 to 3130	3131 to 3140	3141 to 3150	3151 to 3160	3161 to 3170	3171 to 3180	3181 to 3190	3191 to 3200	3201 to 3210	3211 to 3220	3221 to 3230	3231 to 3240	3241 to 3250	3251 to 3260	3261 to 3270	3271 to 3280	3281 to 3290	3291 to 3300	3301 to 3310	3311 to 3320	3321 to 3330	3331 to 3340	3341 to 3350	3351 to 3360	3361 to 3370	3371 to 3380	3381 to 3390	3391 to 3400	3401 to 3410	3411 to 3420	3421 to 3430	3431 to 3440	3441 to 3450	3451 to 3460	3461 to 3470	3471 to 3480	3481 to 3490	3491 to 3500	3501 to 3510	3511 to 3520	3521 to 3530	3531 to 3540	3541 to 3550	3551 to 3560	3561 to 3570	3571 to 3580	3581 to 3590	3591 to 3600	3601 to 3610	3611 to 3620	3621 to 3630	3631 to 3640	3641 to 3650	3651 to 3660	3661 to 3670	3671 to 3680	3681 to 3690	3691 to 3700	3701 to 3710	3711 to 3720	3721 to 3730	3731 to 3740	3741 to 3750	3751 to 3760	3761 to 3770	3771 to 3780	3781 to 3790	3791 to 3800	3801 to 3810	3811 to 3820	3821 to 3830	3831 to 3840	3841 to 3850	3851 to 3860	3861 to 3870	3871 to 3880	3881 to 3890	3891 to 3900	3901 to 3910	3911 to 3920	3921 to 3930	3931 to 3940	3941 to 3950	3951 to 3960	3961 to 3970	3971 to 3980	3981 to 3990	3991 to 4000	4001 to 4010	4011 to 4020	4021 to 4030	4031 to 4040	4041 to 4050	4051 to 4060	4061 to 4070	4071 to 4080	4081 to 4090	4091 to 4100	4101 to 4110	4111 to 4120	4121 to 4130	4131 to 4140	4141 to 4150	4151 to 4160	4161 to 4170	4171 to 4180	4181 to 4190	4191 to 4200	4201 to 4210	4211 to 4220	4221 to 4230	4231 to 4240	4241 to 4250	4251 to 4260	4261 to 4270	4271 to 4280	4281 to 4290	4291 to 4300	4301 to 4310	4311 to 4320	4321 to 4330	4331 to 4340	4341 to 4350	4351 to 4360	4361 to 4370	4371 to 4380	4381 to 4390	4391 to 4400	4401 to 4410	4411 to 4420	4421 to 4430	4431 to 4440	4441 to 4450	4451 to 4460	4461 to 4470	4471 to 4480	4481 to 4490	4491 to 4500	4501 to 4510	4511 to 4520	4521 to 4530	4531 to 4540	4541 to 4550	4551 to 4560	4561 to 4570	4571 to 4580	4581 to 4590	4591 to 4600	4601 to 4610	4611 to 4620	4621 to 4630	4631 to 4640	4641 to 4650	4651 to 4660	4661 to 4670	4671 to 4680	4681 to 4690	4691 to 4700	4701 to 4710	4711 to 4720	4721 to 4730	4731 to 4740	4741 to 4750	4751 to 4760	4761 to 4770	4771 to 4780	4781 to 4790	4791 to 4800	4801 to 4810	4811 to 4820	4821 to 4830	4831 to 4840	4841 to 4850	4851 to 4860	4861 to 4870	4871 to 4880	4881 to 4890	4891 to 4900	4901 to 4910	4911 to 4920	4921 to 4930	4931 to 4940	4941 to 4950	4951 to 4960	4961 to 4970	4971 to 4980	4981 to 4990	4991 to 5000	5001 to 5010	5011 to 5020	5021 to 5030	5031 to 5040	5041 to 5050	5051 to 5060	5061 to 5070	5071 to 5080	5081 to 5090	5091 to 5100	5101 to 5110	5111 to 5120	5121 to 5130	5131 to 5140	5141 to 5150	5151 to 5160	5161 to 5170	5171 to 5180	5181 to 5190	5191 to 5200	5201 to 5210	5211 to 5220	5221 to 5230	5231 to 5240	5241 to 5250	5251 to 5260	5261 to 5270	5271 to 5280	5281 to 5290	5291 to 5300	5301 to 5310	5311 to 5320	5321 to 5330	5331 to 5340	5341 to 5350	5351 to 5360	5361 to 5370	5371 to 5380	5381 to 5390	5391 to 5400	5401 to 5410	5411 to 5420	5421 to 5430	5431 to 5440	5441 to 5450	5451 to 5460	5461 to 5470	5471 to 5480	5481 to 5490	5491 to 5500	5501 to 5510	5511 to 5520	5521 to 5530	5531 to 5540	5541 to 5550	5551 to 5560	5561 to 5570	5571 to 5580	5581 to 5590	5591 to 5600	5601 to 5610	5611 to 5620	5621 to 5630	5631 to 5640	5641 to 5650	5651 to 5660	5661 to 5670	5671 to 5680	5681 to 5690	5691 to 5700	5701 to 5710	5711 to 5720	5721 to 5730	5731 to 5740	5741 to 5750	5751 to 5760	5761 to 5770	5771 to 5780	5781 to 5790	5791 to 5800	5801 to 5810	5811 to 5820	5821 to 5830	5831 to 5840	5841 to 5850	5851 to 5860	5861 to 5870	5871 to 5880	5881 to 5890	5891 to 5900	5901 to 5910	5911 to 5920	5921 to 5930	5931 to 5940	5941 to 5950	5951 to 5960	5961 to 5970	5971 to 5980	5981 to 5990	5991 to 6000	6001 to 6010	6011 to 6020	6021 to 6030	6031 to 6040	6041 to 6050	6051 to 6060	6061 to 6070	6071 to 6080	6081 to 6090	6091 to 6100	6101 to 6110	6111 to 6120	6121 to 6130	6131 to 6140	6141 to 6150	6151 to 6160	6161 to 6170	6171 to 6180	6181 to 6190	6191 to 6200	6201 to 6210	6211 to 6220	6221 to 6230	6231 to 6240	6241 to 6250	6251 to 6260	6261 to 6270	6271 to 6280	6281 to 6290	6291 to 6300	6301 to 6310	6311 to 6320	6321 to 6330	6331 to 6340	6341 to 6350	6351 to 6360	6361 to 6370	6371 to 6380	6381 to 6390	6391 to 6400	6401 to 6410	6411 to 6420	6421 to 6430	6431 to 6440	6441 to 6450	6451 to 6460	6461 to 6470	6471 to 6480	6481 to 6490	6491 to 6500	6501 to 6510	6511 to 6520	6521 to 6530	6531 to 6540	6541 to 6550	6551 to 6560	6561 to 6570	6571 to 6580	6581 to 6590	6591 to 6600	6601 to 6610	6611 to 6620	6621 to 6630	6631 to 6640	6641 to 6650	6651 to 6660	6661 to 6670	6671 to 6680	6681 to 6690	6691 to 6700	6701 to 6710	6711 to 6720	6721 to 6730	6731 to 6740	6741 to 6750	6751 to 6760	6761 to 6770	6771 to 6780	6781 to 6790	6791 to 6800	6801 to 6810	6811 to 6820	6821 to 6830	6831 to 6840	6841 to 6850	6851 to 6860	6861 to 6870	6871 to 6880	6881 to 6890	6891 to 6900	6901 to 6910	6911 to 6920	6921 to 6930	6931 to 6940	6941 to 6950	6951 to 6960	6961 to 6970	6971 to 6980	6981 to 6990	6991 to 7000	7001 to 7010	7011 to 7020	7021 to 7030	7031 to 7040	7041 to 7050	7051 to 7060	7061 to 7070	7071 to 7080	7081 to 7090	7091 to 7100	7101 to 7110	7111 to 7120	7121 to 7130	7131 to 7140	7141 to 7150	7151 to 7160	7161 to 7170	7171 to 7180	7181 to 7190	7191 to 7200	7201 to 7210	7211 to 7220	7221 to 7230	7231 to 7240	7241 to 7250	7251 to 7260	7261 to 7270	7271 to 7280	7281 to 7290	7291 to 7300	7301 to 7310	7311 to 7320	7321 to 7330	7331 to 7340	7341 to 7350	7351 to 7360	7361 to 7370	7371 to 7380	7381 to 7390	7391 to 7400	7401 to 7410	7411 to 7420	7421 to 7430	7431 to 7440	7441 to 7450	7451 to 7460	7461 to 7470	7471 to 7480	7481 to 7490	7491 to 7500	7501 to 7510	7511 to 7520	7521 to 7530	7531 to 7540	7541 to 7550	7551 to 7560	7561 to 7570	7571 to 7580	7581 to 7590	7591 to 7600	7601 to 7610	7611 to 7620	7621 to 7630	7631 to 7640	7641 to 7650	7651 to 7660	7661 to 7670	7671 to 7680	7681 to 7690	7691 to 7700	7701 to 7710	7711 to 7720	7721 to 7730	7731 to 7740	7741 to 7750	7751 to 7760	7761 to 7770	7771 to 7780	7781 to 7790	7791 to 7800	7801 to 7810	7811 to 7820	7821 to 7830	7831 to 7840	7841 to 7850	7851 to 7860	7861 to 7870	7871 to 7880	7881 to 7890	7891 to 7900	7901 to 7910	7911 to 7920	7921 to 7930	7931 to 7940	7941 to 7950	7951 to 7960	7961 to 7970	7971 to 7980	7981 to 7990	7991 to 8000	8001 to 8010	8011 to 8020	8021 to 8030	8031 to 8040	8041 to 8050	8051 to 8060	8061 to 8070	8071 to 8080	8081 to 8090	8091 to 8100	8101 to 8110	8111 to 8120	8121 to 8130	8131 to 8140	8141 to 8150	8151 to 8160	8161 to 8170	8171 to 8180	8181 to 8190	8191 to 8200	8201 to 8210	8211 to 8220	8221 to 8230	8231 to 8240	8241 to 8250	8251 to 8260	8261 to 8270	8271 to 8280	8281 to 8290	8291 to 8300	8301 to 8310	8311 to 8320	8321 to 8330	8331 to 8340	8341 to 8350	8351 to 8360	8361 to 8370	8371 to 8380	8381 to 8390	8391 to 8400	8401 to 8410	8411 to 8420	8421 to 8430	8431 to 8440	8441 to 8450	8451 to 8460	8461 to 8470	8471 to 8480	8481 to 8490	8491 to 8500	8501 to 8510	8511 to 8520	8521 to 8530	8531 to 8540	8541 to 8550	8551 to 8560	8561 to 8570	8571 to 8580	8581 to 8590	8591 to 8600	8601 to 8610	8611 to 8620	8621 to 8630	8631 to 8640	8641 to 8650	8651 to 8660	8661 to 8670	8671 to 8680	8681 to 8690	8691 to 8700	8701 to 8710	8711 to 8720	8721 to 8730	8731 to 8740	8741 to 8750	8751 to 8760	8761 to 8770	8771 to 8780	8781 to 8790	8791 to 8800	8801 to 8810	8811 to 8820	8821 to 8830	8831 to 8840	8841 to 8850	8851 to 8860	8861 to 8870	8871 to 8880	8881 to 8890	8891 to 8900	8901 to 8910	8911 to 8920	8921 to 8930	8931 to 8940	8941 to 8950	8951 to 8960	8961 to 8970	8971 to 8980	8981 to 8990	8991 to 9000	9001 to 9010	9011 to 9020	9021 to 9030	9031 to 9040	9041 to 9050	9051 to 9060	9061 to 9070	9071 to 9080	9081 to 9090	9091 to 9100	9101 to 9110	9111 to 9120	9121 to 9130	9131 to 9140	9141 to 9150	9151 to 9160	9161 to 9170	9171 to 9180	9181 to 9190	9191 to 9200	9201 to 9210	9211 to 9220	9221 to 9230	9231 to 9240	9241 to 9250	9251 to 9260	9261 to 9270	9271 to 9280	9281 to 9290	9291 to 9300	9301 to 9310	9311 to 9320	9321 to 9330	9331 to 9340	9341 to 9350	9351 to 9360	9361 to 9370	9371 to 9380	9381 to 9390	9391 to 9400	9401 to 9410	9411 to 9420	9421 to 9430	9431 to 9440	9441 to 9450	9451 to 9460	9461 to 9470	9471 to 9480	9481 to 9490	9491 to 9500	9501 to 9510	9511 to 9520	9521 to 9530	9531 to 9540	9541 to 9550	9551 to 9560	9561 to 9570	9571 to 9580	9581 to 9590	9591 to 9600	9601 to 9610	9611 to 9620	9621 to 9630	9631 to 9640	9641 to 9650	9651 to 9660	9661 to 9670	9671 to 9680	9681 to 9690	9691 to 9700	9701 to 9710	9711 to 9720	9721 to 9730	9731 to 9740	9741 to 9750	9751 to 9760	9761 to 9770	9771 to 9780	9781 to 9790	9791 to 9800	9801 to 9810	9811 to 9820	9821 to 9830	9831 to 9840	9841 to 9850	9851 to 9860	9861 to 9870	9871 to 9880	9881 to 9890	9891 to 9900	9901 to 9910	9911 to 9920	9921 to 9930	9931 to 9940	9941 to 9950	9951 to 9960	9961 to 9970	9971 to 9980	9981 to 9990	9991 to 10000
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Exhibit 6-9: Excess Medical Costs per Smoking Related Premature Death

	Excess Med. Cost 5 Year Total (million)	Adjustment Factor	Annual Excess Medical Cost (million)	Annual Excess Med. Cost Per Prem. Death (dollars)
Male	113,500	0.95	21,526	
Female	73,100	0.95	13,884	
Both Sexes	186,600	0.95	35,391	85,174

1. Excess medical costs for the 1965 population of ever smokers versus never smokers in 1990 dollars. This figure accounts for the extended life expectancy of never smokers and the medical expenses incurred during those years.
2. Excess medical costs provided by Hodges are discounted by 3%. To obtain the undiscounted value, we multiply by 1.06. To obtain the excess cost of a "nonsmoking smoker", we multiply by 0.87 (see Hodges, 1992).

Source: Hodges (1992)

Exhibit 6-10: Costs Per Smoking Related Premature Death and Life Years Lost

	Direct Medical (dollars)	Lost Earnings Morbidity [1] (dollars)	Lost Earnings Mortality [2] (dollars)
Excess Cost per Premature Death	65,174	15,630	
Cost per Life Year Lost to Age 65			31,150

1. Calculated from OTA, 1993
2. Estimated daily earnings of smokers (see Exhibit 5-2) times 260 days times 1.2 to account for earnings after 65.

Exhibit 6-11: Annual Savings Due To Changes in Smoking Behavior

Base-No Restrictions

	Low Estimate			High Estimate		
	Direct Medical [1] (million)	Lost Earnings Morbidity [1] (million)	Lost Earnings Mortality [1] (million)	Direct Medical [1] (million)	Lost Earnings Morbidity [1] (million)	Lost Earnings Mortality [1] (million)
Savings from Smoking Restrictions						
3% Discount						
Quitting	343	67	246	888	134	495
Reduced Consumption	2,221	434	826	4,443	867	1,952
Reduced Initiation	513	100	983	1,026	200	1,965
Total	3,077	601	2,056	6,155	1,202	4,112
5% discount						
Quitting	367	75	203	773	151	406
Reduced Consumption	1,838	359	1,127	3,676	716	2,253
Reduced Initiation	161	31	448	322	63	896
Total	2,366	466	1,778	4,771	932	3,555
7% Discount						
Quitting	367	76	170	774	151	339
Reduced Consumption	1,589	310	1,319	3,179	621	2,638
Reduced Initiation	67	13	230	135	26	459
Total	2,044	399	1,719	4,088	798	3,438

1. Estimates provided here only for those interested. These are not included in evaluation of benefits. See text.

Exhibit 7-1: Percent of Worksites with 50 or More Employees that Prohibit Smoking or Restrict Smoking to Separately Ventilated Areas

Size of Worksite	Percent
50 - 99	55%
100 - 249	61%
250 - 749	66%
750 +	74%
All Sites	59%

Exhibit 7-2: Number of States and Territories with Legislated Smoking Restrictions - 1993

	None	Designated Areas Only	Designated w/Separate Ventilation	100% Smoke Free
Public Places	13	40	0	0
Government Workplace	18	34	1	0
Private Workplace	35	18	0	0
Restaurants	22	31	0	0
Bars	53	0	0	0

Exhibit 7-3a: Proportion of All Employees Under Restrictive Smoking Policies

	Assumed % of Firms with Restrictive Policies			
	Firms w/more than 50 Emp.	Firms Under 50 Employees:		
Percent all Employees	56%	5%	10%	15%
	45%	55%	55%	55%
				55%
% Employees Covered by Ban or Lounge	56%	29%	32%	35%
				40%
% Employees Covered by Smoking Ban	34%	18%	21%	24%
				29%
% Employees Covered by Lou Assume 20% meet HR3434 Standards	25%	11%	11%	11%
	5%	2%	2%	2%
				2%

Exhibit 7-3b: Proportion of Employees with Smoking Bans and Lounges

	Before HR 3434	After HR 3434	Low	High
Smoking Bans	21%	90%	90%	80%
Complying Smoking Lounge	2%	10%	10%	20%
Total Compliance	23%	100%	100%	100%

Exhibit S-1: Summary of Costs and Benefits*

Basis = 100 Prematures

	****2% Discount Rate**** Low Estimate High Estimate (Millions of Dollars)		****3% Discount Rate**** Low Estimate High Estimate (Millions of Dollars)		****7% Discount Rate**** Low Estimate High Estimate (Millions of Dollars)	
	Low Estimate	High Estimate	Low Estimate	High Estimate	Low Estimate	High Estimate
Cost of Implementing the Legislation						
Smoking Bans	616	1,697		1,484		1,591
Smoking Lounge	159	455		455		455
National Enforcement	251	912		830		837
	100	500		500		500
Benefits from Reduced Exposure to the ETS						
Value of Premature Deaths Avoided			49,293	66,491	41,891	77,911
Home Exposure						
Workplace Exposure	789	2,819		2,432		2,384
Improved Health ¹	41,896	76,310	39,091	71,390	36,119	68,588
Increased Occupant Comfort	8,721	9,541	8,721	9,541	2,721	9,541
Savings in Operating and Maintenance Expenses						
Housekeeping	8,164	10,019		10,019	8,164	10,019
Maintenance	2,974	4,399		4,399	2,974	4,399
	1,260	5,910		5,910	1,260	5,910
Net Change in Productivity						
Savings in Reduced Smoker Absenteeism	329	407		370	199	399
Savings in Smoking Related Fire	699	699		699	699	699
Value of Injuries and Deaths Avoided						
Residential	993	997		997	993	997
Non-Residential	308	184		184	204	184
Property Damage Avoided	112	121		121	112	121
Benefits Without Regard to Smokers [2]	99,079	99,569		99,931	90,997	99,992

Benefits or Losses Regarding Smokers

Premature Deaths Avoided (Smokers)	Assumed Average over 10 Year Period		Assumed Rate After 80 Years	
	Low Estimate	High Estimate	Low Estimate	High Estimate
Quit Smoking	5,440	10,880	0	0
Reduced Consumption	26,209	91,708	39,717	77,930 (1)
Reduced Initiation	9,911	7,832 (3)	20,727	41,476 (3)
Total	39,482	99,728	69,458	119,998
Smoker Losses to Smokers			0	0

*Totals may appear to be greater than the sum of individual items due to rounding.

1. Not estimated. Based on the assumption that the value of reduced suffering reduction in children.

2. Considers just the above costs and benefits.

3. Annual premature deaths avoided after 80 years. Annual reduction in premature deaths gradually increases over the first 80 years before it reaches a constant value.

Exhibit S-3: Analysis of Alternative Baselines*

	Low Baselines (1)			
	Scenario F1 New Baseline in Restrictions (1980 Qtr. Cons.)	Scenario F2 Current Baseline in Restrictions (1980 Qtr. Cons.)	Scenario F3 70% Restrictions in 10 Years (1980 Qtr. Cons.)	Scenario F4 Current Baseline in Restrictions 80% Restrictions in 10 Years (1980 Qtr. Cons.)
Cost of Implementing the Legislation	010	470	208	459
Baseline from Reduced Expenditure on GPO	48,303	54,084	19,821	33,854
Savings in Operating and Maintenance Expenses	5,164	3,996	1,766	3,893
Net Change in Productivity	0	0	0	0
Savings in Reduced Number Absentees	223	172	77	167
Savings in Building Related Prices	505	489	209	465
Net Benefits	56,076	36,023	17,369	31,780

*Costs may appear to be greater than the sum of individual items due to rounding.

1. All estimates use 2% discount rate, and assumes the same enhancement cost of \$100 million.

2. This is the scenario used in the main text.

3. The principal estimate in the text for assessing the effects of H.R. S-344 are based on this scenario.

4. The principal estimate in the text for assessing the effects of H.R. S-344 are based on this scenario.

5. Per capita consumption has declined by about 3% per year from 1980 to 1980 (1980-1980). Assumes the rate of decline will continue for 10 years, and then level off.

6. Assumes the rate of decline in per capita consumption over the past 10 years will continue for the next 20 years and then level off.

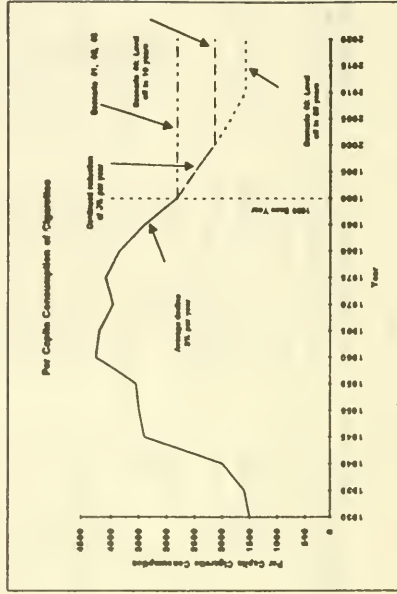
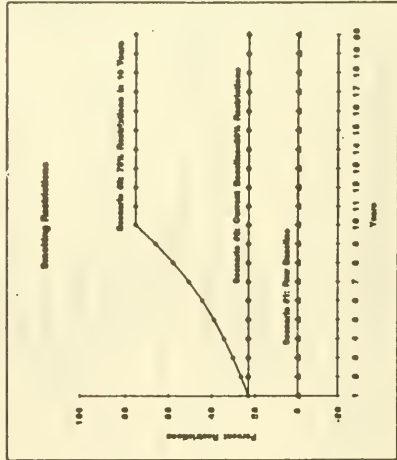


Exhibit 8-4: Benefits Minus Costs
Based on 25% Restrictions

Low Estimate

High Estimate

Low Benefits Minus High Costs

in million			
5% Disc. Rate	6% Disc. Rate	7% Disc. Rate	7% Disc. Rate
36,023	37,287	36,041	
72,368	69,170	64,884	
36,064	36,311	35,057	

APPENDIX A

Review of Selected Literature

Appendix A-1

Value of Avoiding the Risk of Premature Death

The Environmental Protection Agency recently undertook a review of various approaches to evaluating the value that persons place on an incremental risk of death (Unsworth, 1992), sometimes referred to as the value of a statistical life. In general, the studies attempt to determine people's willingness to pay to avoid an increase in the risk of premature death. The following summarizes portions of that review.

Methodological Issues

There are three types of estimates that are commonly used. They are wage-risk studies, contingent evaluation studies, and consumer behavior studies. Wage-risk studies estimate the additional compensation individuals demand in the labor market for taking riskier jobs. Contingent valuation studies ask individuals to state how much they would pay to avoid additional increments of statistical mortality risk. Finally, consumer behavior studies examine market situations (e.g. smoke detectors) other than the labor market that involve a risk-dollar tradeoff.

Most studies reported in the literature apply a wage-risk framework. These studies compare wage rates among different jobs involving different risks and estimate the amount of additional compensation that is associated with the additional risk. Difficulties in these studies include isolating job related risks from risks associated with lifestyle, and isolating compensation due to job related risk from other job related factors that may account for wage differentials. Wage-risk studies assume a perfect labor market in which workers are free to move between jobs and where wages respond readily to forces of supply and demand for labor. The prevalence of unions and other institutional forces which move the labor market away from a perfectly competitive state compromise the validity of these studies. Most wage-risk studies rely on wage data for manual labor and therefore may not be fully representative of the population at large.

The subject population may not be representative for other important reasons. Individuals value risk differently. Some individuals are inherently more apt to accept risk than others. The base level of risk in one's life may be a factor. It has been suggested, for example, that individuals with higher baseline risks tend to place a higher value to risk reduction (Blomquist 1981).

Age is another important factor. It is generally assumed that if one were to differentially value saving the life of a young person compared with saving the life of an elderly person, that the young person's life would be valued more highly. However, the propensity to avoid mortality risk tends to increase with age. That is, the elderly tend to value opportunities to avoid risk more highly, and they therefore reveal a greater implicit value of life. To avoid distortion, the age distribution of subjects in the study should represent the population to which the value of life estimates are being used.

All value of life studies involving the market value of risk suffer from difficulties encountered when participants in the study, or in the market being studied, perceive the risks to be different than the true risks. If, as is sometimes the case, those accepting the risk

as part of the market transaction (or as part of a contingent evaluation study) underestimate the true risks, then the market (or the contingent evaluation study) will undervalue the risks. In addition, since many individuals have difficulty accurately distinguishing, for example, between the risk of death at 1 in 100,000 versus 1 in 1,000,000, value of life estimates can easily be distorted, perhaps by an order of magnitude.

Finally, the way in which individuals value risk depends on the type of risk. Voluntary risks are generally more acceptable than involuntary risks. Other factors of potential importance include whether the risk is controllable or uncontrollable, ordinary or catastrophic, old or new, necessary or unnecessary, and occasional or continuous (Litai 1980).

Review of the Literature

Unsworth (1992) reviewed three major surveys of the literature of the value of a statistical life in which each of these methods was evaluated: Viscusi (1992), Miller (1990), and Fisher *et al.* (1989). The summary of results provided by Unsworth is presented in the exhibit below

Viscusi (1992) examined 39 wage-risk, consumer market and contingent valuation estimates of the value of life. He concludes that labor market studies with carefully constructed risk variables, and contingent value studies with relatively large sample sizes are the most suitable for policy applications. Applying his expert judgement, he finds that the most reasonable estimates of the value of life are clustered in the \$3-\$7 million range (1990 dollars).

Fisher *et al.* (1989) examined 21 studies of willingness to pay for reductions in risk. They conclude the most defensible estimates lie in a range from \$1.9-\$10 million (1990 dollars). The authors go on to express a greater confidence in the lower end of this range. However, they also suggest that this range is an underestimate.

Miller (1990) examined 67 estimates of the value of life in which he considered 47 to be reasonably sound. Making adjustments to the 47 studies on the basis of age, income, accuracy of risk perception, and baseline level of risk, Miller calculates a mean value of the adjusted 47 studies of \$ 2.4 million (1990 dollars), and considers a relevant range to be plus or minus 30% of the mean, or \$1.7-\$3.1 million.

Choice of an Appropriate Range of Estimates

Of the three surveys reviewed, Unsworth (1992) concludes that Viscusi and Fisher *et al.* are a more appropriate starting point for estimating the value of life, because Miller incorporates estimates from consumer behavior studies which are deemed less appropriate for environmental policy purposes, and because the adjustments made by Miller are subject to considerable debate and are less defensible. Unsworth (1992) further suggests that Viscusi estimates are more appropriate because they include more recent studies, and also include more recent versions of some of the studies also considered by Fisher *et al.* to be sound.

Unsworth (1992) then adds two studies included in Fisher *et al.* (1989), and which Viscusi will include in a more recent survey soon to be published in the *Journal of*

Economic Literature. Applying criteria suggested by Viscusi (1992) for studies applicable to policy analysis, Unsworth (1992) narrows the review to 26 studies. Simulating a lognormal distribution and two triangular distributions, and comparing the shape of the simulated distributions to the observed distribution of the 26 studies, Unsworth (1992) concludes that the lognormal distribution is the most appropriate. That distribution has a mean value of \$4.8 million per life saved, and a standard deviation of \$ 3.2 million.

SUMMARY OF RECENT VALUE-OF-LIFE SURVEYS

Survey Author and Publication Date	Number and Type of Studies Surveyed	Range of Reported Best Estimates of Value of Life (1990 dollars)	Recommendations (1990 dollars)	Comments
Vivona (1992)	19 studies published from 1974 to 1991 (26 wage risk studies, 7 consumer market studies, 6 contingent value studies)	\$70,000 to \$16.2 million (originally reported in 1980 dollars)	Most reasonable estimates of the value of life are clustered in the \$1 to \$7 million range	- Concludes that market studies other than wage risk studies are not appropriate for policy application - Concludes that structural models do not yield robust estimates - Places less emphasis on "explanatory" job/wage contingent valuation studies
Fisher, Chestnut, and Voshell (1989)	21 studies published from 1974 to 1988 (15 wage risk studies, 4 consumer market studies, 2 contingent valuation studies)	\$50,000 to \$101 million (or \$450,000 to \$8.5 million as originally reported 1986 dollars)	The most defensible empirical results indicate a range of estimates from \$19 to \$101 million	- Concludes that wage risk estimates below \$19 million result from biases in the measured risk variable and thus should not be used for policy purposes - Concludes that results from consumer market studies reflect potentially significant downward biases - States that most estimates reported in the literature underestimate the value per statistical life appropriate for environmental policy analysis
Melton (1990)	67 studies published from 1973 to 1988 (37 wage risk studies, 15 consumer market studies, and 15 contingent valuation studies)	\$40,000 to \$16.7 million (or \$36,000 to \$15.1 million as originally reported 1988 dollars)	The suggested value of a statistical life for use in cost benefit analysis and legal damage cases is in the range from \$1.7 million to \$11 million, with a central tendency of \$2.4 million	- Adjusts studies for: use of before tax income, error in risk perception, error in specification of risk variables, exclusion of non fatal injury risks, age of sample population, and applies a standardized 2.5 percent discount rate - Includes 20 studies from consideration based on concerns over study quality

Note: All values converted to 1990 dollars using the CPI deflator

APPENDIX A-2

Review of Recent Literature on the Effect of
Smoking Policies on Smoking Behavior*Studies Suggesting Limited Effect*

Baile, Walter F. *et al.*, 1991. *Impact of a Hospital Smoking Ban: Changes in Tobacco Use and Employee Attitudes*. Addictive Behaviors. Vol. 16. pp. 419-426.

A survey was taken approximately 4 months after a hospital wide smoking ban at the Lee Moffit Cancer Center and Research Institute where a hospital wide ban on smoking was instituted. Separate questionnaires were developed for smokers, non smokers and those who had quit smoking since the ban. Only five out of 88 smokers quit since the policy. The authors conclude that the ban had little effect on employee quit rates.

Beiner, Lois *et al.*, 1989. A Comparative Evaluation of a Restrictive Smoking Policy in a General Hospital. American Journal of Public Health. Vol. 79. No. 2. February.

A comparative study was made of two similar hospitals. One hospital instituted a restrictive smoking policy while the other did not. Surveys were conducted one month prior to the policy, and 6 months and 12 months after the policy. No significant difference was found in the quit rates at the two hospitals. However, cigarette consumption while at work was reduced at the policy hospital, without a commensurate increase in smoking while at home.

The smoking policy in the policy hospital was only partially restrictive. Smoking was permitted in sections of the cafeteria and coffee shop, and patients were also allowed to smoke in their rooms if their roommate did not object. It is not clear what impact the policy may have had if the policy were more restrictive.

Gottlieb, Nell H. *et al.*, 1990. Impact of a Restrictive Work Site Smoking Policy on Smoking Behavior, Attitudes, and Norms. Journal of Occupational Medicine. Vol. 32. No. 1. January.

Questionnaires were mailed to employees of the Texas Department of Human Resources. Subjects were surveyed 3 months prior to implementation of a smoking policy (but 2 months after it was announced), and 1 month and 6 months after the policy became effective. The results showed no significant change in smoking prevalence, quit attempts, or daily cigarette consumption. However, cigarette consumption while at work was significantly reduced.

Daughton D.M. *et al.*, 1992. Total Indoor Smoking Ban and Smoker Behavior.

Preventive Medicine. Vol 21. No. 5. pp 670-76. September.

Hospital employees were surveyed 1 year after announcing, and 5 months after implementing a total ban on smoking. A second follow up survey was conducted 2 years after the announcement. The results showed little effect on overall institutional quit rates. However, there was a decrease in consumption during working hours, particularly by moderate to heavy smokers.

Petersen, Lyle R. *et al.* 1988. *Employee Smoking Behavior Changes and Attitudes Following a Restrictive Policy on Worksite Smoking in a Large Company.* Public Health Reports. Vol. 103. No. 2. March-April.

Study of an Connecticut insurance company which adopted a smoking ban in all areas except in designated rest rooms and lounges. The authors collected data 1 year prior and 1 month and 3 months after the policy. The results suggested no increase in quit rates but a substantial reduction in cigarette consumption.

Studies Showing a Moderate to Substantial Effect

Brenner, Hermann and Mielck, Andreas. 1992. Smoking Prohibition in the Workplace and Smoking Cessation in the Federal Republic of Germany. Preventive Medicine. Vol 21. pp 252-261.

A national survey was conducted in the Federal Republic of Germany, with an overall response rate of 66%. Respondents were asked if smoking was allowed in their workplace. Quit ratios for women and men were examined and compared with workplace smoking policy. Smoking restrictions at the workplace showed no affect on the quit ratio for men (0.32 smoking allowed, vs. 0.33 smoking not allowed) but showed a substantial affect for women (0.18 smoking allowed vs 0.45 smoking not allowed). Both men and women showed a considerably higher attempt to quit rate in places where smoking was not allowed. The mean number of cigarettes smoked per day for men was 20.2 (smoking allowed) and 18.4 (smoking not allowed), and for women was 17.1 (smoking allowed) and 15.7 (smoking not allowed). This represents a 9% and an 8% reduction for men and women respectively.

Borland *et al.* 1990. Effect of Workplace Smoking Bans on Cigarette Consumption. American Journal of Public Health. Vol. 80. No 2. February.

A total of 2,113 employees at the Australia Public Service were surveyed to determine the effect of a smoking ban on smoking behavior. Surveys were completed two and four weeks before and five to six months after the ban was instituted. The pre-ban results showed that individuals restricted from smoking at their work stations consumed an average of 16.01 cigarettes per day compared with 20.54 cigarettes per day (22% less) at stations where smoking was allowed. After the ban, the consumption rates were 14.16 and 15.36 (8% less) respectively. This shows that the effect of the workplace ban was to reduce consumption by 12% (16.01 versus 14.16) where there were prior work station restrictions, and by 25% where

there were no prior work station restrictions on smoking.

Borland, Ron, *et al.* 1991. Predicting Attempts and Sustained Cessation of Smoking After the Introduction of Workplace Smoking Bans. *Health Psychology*. Vol 10. No. 5. pp 336-342.

Using the data from the survey of Australia Public Service employees, the authors examined factors that predict the initiation of cessation attempts, and the maintenance of cessation. The strength of the desire to quit was the best predictor of making an attempt to quit. Having quit before the ban, as well as support from family and friends were also good predictors of attempting to quit. As expected, heavy smokers have the most trouble maintaining abstinence, and persons who have quit before are less likely to maintain abstinence. Social support for quitting was a modest predictor of maintenance. The authors postulate that the imposition of smoking bans should provide a context where smoking cessation is more likely.

Hocking Bruce, *et al.* 1991. A Total Ban on Workplace Smoking Is Acceptable and Effective. *Journal of Occupational Medicine*. Vol 33. No. 2 February.

Telecom Australia is a telecommunications organization with 85,000 staff. After several years of introducing progressively more restrictive policies, Telecom Australia introduced a total ban on smoking in 1988. Prior to and 6 and 18 months after the ban, a survey of employees was conducted in representative areas. The number of smokers decreased by about 5% over the two year period, compared with 2% for the Australian community as a whole. In addition, smokers were smoking 3-4 fewer cigarettes/day after the ban.

Hudzinski, Leonard D. 1990. One-Year Longitudinal Study of a No-Smoking Policy Medical institution. *CHEST*. Vol 97. No. 5. May.

The Ochner Medical Institutions in New Orleans instituted a campus wide smoke free policy. A survey (1986-87) was conducted 6 months prior, 6 months after, and 1 year after the policy was instituted. Results suggested a 30% reduction (from 20 to 14%) in population of smokers after 1 yr. Half of those who quit said the policy had helped them a great deal. 80% of smokers after 1 year smoked less than 8 cigarettes per day.

Sorensen e. al. 1993. Promoting Smoking Cessation at the Workplace: Results of a Randomized Controlled Intervention Study.

In a controlled intervention study at 8 sites in Bloomington Minnesota, smokers were surveyed 1 month and 6 months after a three month intervention program was completed. The intervention consisted of consultation with employees about the adoption of a nonsmoking policy, training to nonsmokers in providing assistance to smokers attempting to quit, and cessation classes for smokers. After 1 month, the quit rate for the intervention group was 11.5% compared to 5.2% for the

control group. At the 6 month interval, the quit rate for the intervention group was 12 % compared to 8.8% of the control group. These rates are adjusted for the effects of age, sex, and education. Quit rates were based on answers to the simple question, "Do you now smoke cigarettes?" and also, not assessing the length of abstinence. The long term quit rates therefore are likely to be substantially lower than those reported. Those supported by an intervention program had a slightly higher quit success rate than those without such a policy.

Sorensen G. et. al. 1991. Effects of a Worksite Nonsmoking Policy: Evidence of Increased Cessation. *American Journal of Public Health*. Vol. 81, No. 2, February.

In 1986, the New England Telephone Company instituted a no smoking policy. A random sample of employees was taken 20 months after the policy was implemented. The results revealed a 21% reduction in smokers after 20 months (reduced to 18 % for those who had quit for more than 3 months). 42% of those who quit (9% of smokers) attributed their quitting to the no smoking policy.

Sorensen, Glorian and Pechacek, Terry F. 1989. Implementing nonsmoking policies in the private sector and assessing their effects. *New York State Journal of Medicine*. Vol. 89. January.

Data was collected in a telephone interview from 711 smokers and recent ex-smokers at seven worksites in Bloomington, Minnesota. In a survey conducted in 1986, 12-18 months after intervention, 58% felt that quitting would be easier if they could not smoke at work. Of the 42% who tried to quit in the last 2 years, 20% succeeded.

Stave, G.M. and Jackson, G.W. 1991. Effect of a Total Work-site Smoking Ban on Employee Smoking Attitudes. *Journal of Occupational Medicine*. Vol 33. No.8. pp 884-90.

In this study, the authors compared data on smoking attitudes and behaviors at Duke University Medical Center which adopted a smoking ban, and on an adjacent campus where no such ban was adopted. Surveys were conducted three months and 9 months after the smoking ban was in affect (9 months and 15 months after announcement). Three months after policy implementation, mean cigarette consumption during working hours had dropped from 8.1 to 4.3 cigarettes

(47% decline) at the medical center and from 9.3 to 8.78 (6% decline) at the University Campus. In the fifteen months after the announcement 12.6% of smokers at the Medical Center and 6.9% at the University Campus had quit.

Stillman, Frances A. et al. Ending Smoking at The Johns Hopkins Medical Institutions: An Evaluation of Smoking Prevalence and Indoor Air Pollution. *JAMA*, Vol 264. No. 12. September 26, 1990.

In 1988, The Johns Hopkins University Hospital Complex decided to eliminate

smoking in all areas of the building complex. Previous policy allowed smoking in designated areas of cafeterias, waiting areas, lounges, patient areas and offices. Surveys were conducted 6 months before and 6 months after the policy was instituted. Smoking prevalence declined from 21.7% to 16.2% (25% decline). The number of cigarettes smoked per day went from 16.4 to 13.1 (20% decline), and the cigarettes smoked while at work went from 7.8 to 3.8 (51% decline). The quit rate was 20.4% between surveys, but would be reduced to 10% assuming all nonrespondents (50%) did not quit. For those that had quit for more than 3 months at the time of the survey, the quit rates are adjusted to 18.2% and 9% respectively.

Wasserman, Jeffrey, *et al.* 1991. The Effects of Excise Taxes and Regulations on Cigarette Smoking. *Journal of Health Economics*. Vol 10. pp 43-64.

The authors used data on smoking status and behavior from 1970 to 1985 for adults from the National Health Interview Survey, conducted annually by the National Center for Health Statistics. Data for teenagers was taken from the National Health and Nutrition Examination Survey II. A generalized linear model was used to estimate the effects of excise taxes and regulations on adult and teenage smoking behavior.

The authors used a regulation index in which a value of one was assigned to communities with comprehensive smoking laws in most public places, including that including restrictions in workplaces, zero for no restrictions in any places, and values of .75, .50, .25 for combinations in between. They used a two stage model in which the decision to smoke and the level of demand were analyzed sequentially.

The authors predict that if the regulation index was raised from 0.25 (smoking restrictions in areas where people spend little time) to 1.00 (restrictions in almost all places, including workplaces), then per capita cigarette consumption for adults would decrease by 5.9%. For adults, the regulation index had a statistically significant result only on the number of cigarettes smoked, not on the decision to smoke. The same change in the regulation index would have a different effect on teenage behavior. Teenage consumption would decrease by 41%. However, this effect results mostly from preventing teens from starting to smoke rather than reducing the consumption of teenage smokers.

Woodruff, T. J. *et al.* 1993. Lower Levels of Cigarette Consumption Found in Smoke-free Workplaces in California. *Archives of Internal Medicine*. Vol 153. No. 12. pp 1485-93. June 28.

Woodruff, *et al.* (1993) applied a logistics regression on data from the 1990 California Tobacco Survey in which subjects were queried by telephone. Prevalence was 13.7% in smoke-free workplaces compared with 20.6% in places with no restrictions (33% difference). When the influence of demographic variables were accounted for, it was estimated that persons with little restrictions on smoking were approximately 30% more likely to be smokers than were those working in smoke-free workplaces.

The workplace smoking policies showed little effect on changing the smoking status

of persons who were regular smokers 1 year prior to the survey. Approximately 85% remained regular smokers regardless of workplace smoking policy. The authors note that most of California's smoking policies had been implemented before the survey date of July 1990, and that smokers who were likely to change their behavior had already done so by the time the survey was taken.

However, there was a substantial effect of smoking policies on the proportion of occasional smokers who became regular smokers. Of those that had been occasional smokers one year prior to the survey, 21% had become regular smokers in smoke free workplaces compared to 33% in workplaces with no restrictions. No data were shown for individuals who were previously non smokers.

Cigarette consumption per smoker was 13 % less among those with no workplace restrictions compared with those working in a smoke-free environment (296 versus 341 packs per year). Accounting for reduced smoking prevalence and reduced consumption by smokers, including occasional smokers, the authors estimate that if all workplaces were smoke free, consumption would be 41% lower than if there were no workplace smoking restrictions.

APPENDIX B

Technical Appendix
Housekeeping and Maintenance Impacts of H.R. 3434

Offices

Offices reported reduced cleaning costs due to reduced emptying and cleaning of ashtrays, easier dusting of desktops and high areas, reduced washing of walls, reduced cleaning of carpets, reduced cleaning of venetian and horizontal blinds, reduced cleaning of HVAC vents, and reduced cleaning of indirect lighting. For the purposes of this analysis, savings associated with ash trays, dusting desktops and high areas, cleaning venetian/horizontal blinds, and cleaning HVAC vents are quantified. Cleaning costs are estimated using a prototype annual cleaning budget for items that would change in a smoke-free environment. Generally, the estimates are calculated by multiplying the time required for each task by the labor rate and the frequency that each task would be performed on an annual basis to develop annual costs per 1,000 square feet. Detailed calculations are discussed below:

- **Ash trays:** The analysis assumed that under a smoking environment, ash trays would be emptied and cleaned each business day for a total of 250 times per year (52 weeks multiplied by 5 days per week, minus 10 holidays). One source actually reported that ash trays in their facility were emptied 3 times per day, however, once per day is more common. In a smoke-free environment, emptying ash trays would be completely eliminated. The estimate of the time required to empty and clean ash trays for 1,000 square feet of office space (2.5 minutes) is from a BOMA report on cleaning costs in office buildings.
- **Dusting:** According to one documented study by BOMA, the dusting of desks was reduced from daily to once per week in an office with a non-smoking policy. The analysis assumes that the frequency for dusting desktops will be reduced from 250 times per year to 52 times per year. The estimate of the time required to dust desk tops for 1,000 square feet of office space (2.2 minutes) is from a BOMA report on cleaning costs in office buildings.
- **Dusting High Areas:** According to the BOMA study, the dusting of high areas (top of partitions) was reduced from once per week to once per month. The analysis assumes that the frequency for dusting high areas will be reduced from 52 times per year to 12 times per year. The estimate of the time required to dust high areas for 1,000 square feet of office space (4.5 minutes) is from a BOMA report on cleaning costs in office buildings.
- **Cleaning Venetian/Horizontal Blinds:** According to the BOMA study, the cleaning of blinds was reduced from 6 times per year to once per year. The analysis assumes that the frequency for dusting high areas will be reduced from 6 times per year to 1 time per year. The estimate of the time required to clean blinds for 1,000 square feet of office space (20 minutes) is from a BOMA report on cleaning costs in office buildings.
- **Dusting HVAC Vents:** According to the BOMA study, the dusting of HVAC vents was reduced from 4 times per year to once per year. The analysis assumes that the frequency for dusting vents will be reduced from 4 times per year to 1 time per year. The estimate of the time required to dust HVAC vents for 1,000 square feet of office space (10.0 minutes) is from a BOMA report on cleaning costs in office buildings.

Cost savings in offices were also reported due to reduced damage to carpets, furniture, and computer equipment. Cigarette burns to carpets would be eliminated in a smoke free

environment. Managers have the choice of either repairing burns or replacing the entire carpet when the problem becomes too noticeable. This analysis assumes that carpets will be repaired at an estimated cost of \$100 per burn. One carpet repair is estimated to be necessary per year per 1,000 square feet of office.

Office furniture will also be protected from burn damage in a smoke-free environment. One article estimated that furniture would last three times as long with a smoking ban. Tax policy estimates that the average depreciation life of business furniture is 7 years. The analysis assumes that offices will normally replace furniture once every 7 years (when it can no longer be depreciated) if there is no excess damage to the furniture (from burns, for example). Following the estimate that furniture would need to be replaced three times as often would lead to replacing furniture once every 2 to 3 years in a smoking environment. Although this may be accurate in extreme cases, the norm is probably less. The analysis assumes that office furniture would be replaced once every 5 years in a smoking environment in comparison with once every 7 years in a smoke-free building. The value of office furniture was estimated by determining the average price of a desk and upholstered desk chair from a large office furniture supplier (\$525 for a desk and \$230 for a chair). Six desk and chair sets were assumed to be contained in 1,000 square feet of office space (based on occupancy standards).

Computer equipment, especially personal computers, represent another category of potential savings in a smoke-free environment. Computers will remain cleaner, requiring less time to repair and, in extreme cases, not need to be replaced as frequently. Based on interviews, the analysis assumes that computer keyboards used by smokers will require replacement once every 1.5 years in comparison with once every 5 years for keyboards used by non-smokers. Also, maintenance and repairs to computers of smokers would take 30 minutes longer due to increased cleaning required.

The need for painting would also be reduced. The analysis assumes that painting would be required once every 5 years in a smoking environment and once every eight years in a non-smoking area. The estimate of time required to paint 1,000 sq. ft of office space is from Means Facilities Maintenance Standards.

Will every building or business experience the potential savings estimated? A survey of businesses found that 43 to 60 percent of businesses instituting a smoking ban experienced maintenance cost savings. There are many plausible explanations as to why a firm may not experience cost savings. For example, a business may have a fixed maintenance and janitorial staff that will not be reduced but work on other activities if the smoking-related activities are reduced. Also, some businesses may not be able to renegotiate existing cleaning contracts. Finally, some businesses may simply have a higher tolerance for a dirty, dingy environment with damaged carpets and furniture.

To take into account these possibilities, a high and low estimate of savings is calculated. Also, it is assumed that only a portion of potential office space will fully realize the benefits. For Offices, the low estimate included cleaning cost savings and reduced painting. In the case of cleaning, 60 percent of the total square feet (7,081 million sq. ft out of 11,802 million sq. ft) of office space is estimated to report the savings. For painting, some tenant occupied office space will in fact be painted more often than once every 5 years due to turnover of occupants. To take this into account, the savings is only claimed for offices expected to have longer occupancy including government owned space and single-owner occupied space (6,610 million sq. ft).

In the high estimate, carpet repairs, replacing of office furniture, replacing computer keyboards,

and computer maintenance are added to the low estimate. Carpet repairs and furniture replacement are calculated for 60 percent of the total square feet (7,081 million sq. ft out of 11,802 million sq. ft) of office space. Computer-related costs are calculated based on the estimate of personal computers used by smokers in the workforce (estimated at 25 percent of 20,330,000 total PC's in the workplace or 6,657,500 personal computers). This figure does not take into account damage to equipment other than PC's such as printers or PC's used by non-smokers, but in an office that permits smoking.

Mercantile and Service

Retail stores and service outlets usually restrict smoking to certain common areas in the building. In these areas, as smoking ban will eliminate the need to empty and damp wipe ashtray stands, reduce sweeping and vacuuming, eliminate carpet burns, reduce the need to clean windows and display cases, and reduce painting. For the purposes of this analysis, cleaning costs are calculated for elimination of cleaning ashtray stands and reduced need to sweep or vacuum. With smoking allowed, ashtray stands were assumed to require cleaning and emptying once every day for approximately 290 days per year. In actuality, ash tray stands may require more frequent cleaning such as two or three times per day, 365 days per year. The cleaning time per 1,000 sq. ft (4.0 minutes) is derived by assuming 10 stands in 1,000 sq. ft requiring 0.4 minutes per stand (from Means Facility Maintenance Standards) to empty and clean. Sweeping and vacuuming is assumed to be required twice per week with smoking allowed and once per week in a smoke-free environment. The time required to sweep/vacuum 1,000 sq. ft is the minimum estimate from Means Facility Maintenance Standards.

Reduced maintenance costs were calculated for reduced carpet repairs and reduced painting. Carpet repairs were estimated using the same assumptions described for Office space. Painting was assumed to be reduced from once every 5 years to once every 7 years. This estimate may be low since retail and service space must retain appearance to attract customers and may therefore have lower tolerance for dingy walls.

Of the total 13,157 million square feet of building space classified as Mercantile and Services in the Department of Energy estimates, it was assumed that for cleaning and carpet repairs, only 60 percent of this space would report savings. For painting, it was assumed that 30 percent would report savings. Of this space, 40 percent was assumed to be in common areas subject to smoking resulting in an applicable area of 3,158 square feet for housekeeping and by 1,579 million square feet for painting.

Food Service

Restaurants and lounges face much the same situation as hotels and motels. One restaurant owner stated that they would need 20 additional employees to empty ashtrays, sweep butts, wash windows, and fill in absences without a no-smoking policy in the establishment. The owner also reported less clean up time and fewer burns on tables. One restaurateur was considering installing expensive air cleaning and filtration equipment that were not necessary when a no smoking policy was instituted.

For the purposes of this analysis, cleaning cost savings were calculated for the elimination of emptying ash trays every day, 6 times per day, under the assumption that ash trays will be

cleaned each time a new group arrives at a smoking table (2,190 times per year). This assumption may be low since staff at nicer restaurants will often clean ashtrays several times during a meal, particularly for heavy smokers. The cost time estimate to clean one ashtray is from Department of the Army Janitorial Formulas. Reduced time due to sweeping butts and washing windows was not estimated.

Painting is assumed to be necessary once every 4 years with smoking instead of once every 5 years. The painting frequency may in fact be much higher in nicer establishments subject to heavy smoking. Damages due to cigarette burns are estimated assuming once carpet repair per year per 1,000 square feet. The need to repair and replace table linens, chairs, and tables is estimated at once every 5 years with smoking and once every 7 years (as employed in tax depreciation calculations) without smoking. The value of a table and chair set is from Means Square Foot Costs.

Expected savings are calculated on the basis of food service seating capacity for smokers. According to the Department of Energy, the food service seating capacity is 27,753,000. It was assumed that 80 percent of this capacity are expected to report savings due to a smoke-free environment. This is a bit higher than the 60 percent expected in office spaces because food service establishments will place a greater emphasis on appearance and cleanliness, and have a lower tolerance for damages. Painting benefits were expected to accrue to 60 percent of the smoking capacity. Assuming that 30 percent of the capacity is used by smokers, the smoking seating capacity is 8,325,900.

Health Care

Health Care facilities contain a number of different types of space that is used for a variety of purposes. Some space is used for administrative purposes such as billing and personnel. The savings to this space would be the similar to that for offices. Space devoted to patient care would have different types of savings. For the purposes of this analysis, administrative space was assumed to have savings identical to those described for offices. It was assumed that 20 percent of space in Health Care facilities will be devoted to administrative functions.

Building space devoted to patient care will contain bed-ridden patients. It was assumed that each smoking patient will require cleaning and emptying of an ashtray twice per day, 365 days per year (730 days per year total). Also, space containing smoking patients will require sweeping 1.5 times more often than rooms with non-smokers (548 vs. 365 times per year).

The total amount of space for Health Care facilities is 4,225 million square feet. Savings identical to those calculated for offices are expected to accrue to 60 percent of this space. Painting savings are expected to accrue to only 30 percent of the potential space. Administrative functions is assumed to account for 20 percent or 845 million square feet.

Savings associated with patient care is calculated on the basis of the number of hospital beds used by smokers. It was assumed that 25 percent of the total beds (25 percent of 3,602,000, or 900,500) would be occupied by smokers. Given that smokers have a higher rate of hospitalization than non-smokers, this figure may be low.

Assembly

Buildings that are used for assembly will accrue benefits to that portion of their space used as a common areas with smoking permitted. The reductions in cleaning and maintenance were calculated using the same categories and assumptions as the common areas for the Mercantile and Services category. Savings are expected to accrue to 60 percent of this space for cleaning and carpet repairs, and to 30 percent for painting. It was assumed that 20 percent of the area expected to report savings would be in common areas, resulting in an applicable area of 821 million square feet for housekeeping and carpet repairs, and 410 million square feet for painting.

Education

As with Health Care facilities, Education facilities can be used in a variety of different ways, particularly at the higher education (college and university) level. Since it is more likely that smoking will be limited in elementary and secondary level schools, this estimate will focus only on institutions of higher learning (colleges, universities, junior colleges). A fair portion of space in colleges and universities is devoted to administrative and office functions. These spaces would accrue the same types of savings as general office space. Colleges and universities would also have common areas similar to Assembly and Mercantile and Services space.

It is expected that benefits will be reported by 60 percent of the total space in colleges and universities (approximately 1,200 million square feet of 2,000 million square feet). For the purposes of this analysis, it was assumed that half of the space in colleges and universities (600 million square feet) will be devoted to administrative and office uses. Benefits for this space were calculated in the same manner as benefits for the office use. Another 20 percent will be in common areas (240 million sq. ft). Benefits for these areas are calculated the same as common areas in other types of buildings (Assembly, for example).

Lodging

Hotels and motels face the unique challenge of maintaining a pleasant, clean, and attractive building in the presence of smoking. Very often business and profits depend on how good a room looks, its overall cleanliness, and its odor. Thus, cleaning, painting, and replacing carpets and furnishings are done at a greater frequency than in an office environment. For the purposes of this analysis, the only cleaning cost savings claimed is from the elimination of emptying and cleaning ashtrays. The same basic methodology as described under offices was used. Carpet repairs were also estimated to occur at the same frequency and cost the same amount. This will probably underestimate actual savings since hotels and motels will have less tolerance to unsightly carpets, thereby leading to increased replacement of carpets rather than repair.

Lodging space can also be divided into different uses. The bulk of the space is used for guest rooms, but some of the space is in common areas. Cost savings for common areas are estimated using the same assumptions as other types of common areas. It is assumed that 20 percent of the Lodging space is devoted to common areas.

Cost savings to guest rooms used by smokers could be quite large including reduced cleaning time for each room, reduced carpet repairs, reduced painting, and reduced replacement of furniture and linens. The need to repair and replace furniture and linens is estimated at once

every 5 years with smoking and once every 7 years (as employed in tax depreciation calculations) without smoking. The value of a standard set of furniture is from Means Square Foot Costs. It is unclear whether H.R. 3434 will prohibit smoking in guest rooms designated for smoking use, thus, savings associated with guest rooms are included only in the high estimate of benefits.

Benefits are expected to accrue to 60 percent of lodging establishments for cleaning, repair and replacing, but to 30 percent for painting savings.

Industrial/Warehouse

Warehouse and industrial environments will have lower aesthetic standards than other types of establishments for their production areas. Reported activities for production areas that would decrease under a no smoking policy for a warehouse include emptying ash trays and sweeping floors. The savings associated with eliminating the need to empty ash trays is calculated in the same manner as for other categories. Savings from reduced sweeping are calculated based on the assumption that the frequency of sweeping would go from 2 times per week to once per week in a smoke free environment, as reported in the literature.

The portion of industrial/warehouse space expected to report savings was assumed at 60 percent. A portion of this space would be devoted to administrative and office functions that would be expected to have the same types of savings as offices. For the purposes of this analysis, 20 percent of the space in this category will be used for administrative purposes and the remaining 80 percent will be used in production areas.

Total Savings

Exhibit B3-1 summarizes the low and high estimates of cleaning and maintenance savings for each building category under H.R. 3434. Total square feet for each building category and applicable square feet are also displayed. The savings per square feet are also calculated.

Exhibit B3-1: Detailed Housekeeping and Maintenance Cost Savings by Type of Establishment

ASSEMBLY

	Potential Savings (per 1000 sq ft)	Total Area (Million Square Feet)	Portion Expected to Report Savings	Applicable Area	Total Expected Savings (millions of dollars)	Total Expected Savings (millions of dollars)
Cleaning:						
Empty and damp wipe surface stands	\$163.52	9,536	4,103	821	\$134	\$134
Sweeping/vacuuming	\$72.80	9,538	4,103	821	\$80	\$80
Maintenance/Repair/Replacement:						
Carpet Repairs	\$100.00	9,538	4,103	821	\$82	\$82
Painting	\$104.38	9,538	4,103	410	\$43	\$43
TOTAL					\$237	\$339

HEALTH CARE

Cleaning:						
Empty and damp wipe surfaces	\$67.50	4,225	2,535	507	\$44	\$44
Dusting Desks	\$42.84	4,225	2,535	507	\$32	\$32
High Dusting	\$58.20	4,225	2,535	507	\$13	\$13
Veneer/Horizontal Blinds	\$7.00	4,225	2,535	507	\$4	\$4
Clean HVAC Vents	\$1.05	4,225	2,535	507	\$1	\$1
Per Hospital Beds used by ambulatory:						
Empty and damp wipe surfaces	\$21.80	3,802,000	2,161,200	500,500	\$20	\$20
Sweeping	\$127.75	3,802,000	2,161,200	500,500	\$115	\$115
Maintenance/Repair/Replacement:						
Repairs Office Furniture	\$271.80	4,225	2,535	507	\$138	\$138
Carpet Repairs	\$100.00	4,225	2,535	507	\$51	\$51
Painting	\$130.48	4,225	2,535	254	\$33	\$33
TOTAL					\$261	\$449

EDUCATION

Cleaning:						
Administrative/Office Space:						
Empty and damp wipe surfaces	\$67.50	9,148	1,200	600	\$53	\$53
Dusting Desks	\$42.84	9,148	1,200	600	\$38	\$38
High Dusting	\$35.20	9,148	1,200	600	\$16	\$16
Veneer/Horizontal Blinds	\$1.40	9,148	1,200	600	\$1	\$1
Clean HVAC Vents	\$4.20	9,148	1,200	600	\$3	\$3
Common areas:						
Empty and damp wipe surface stands	\$140.00	9,148	1,200	240	\$24	\$24
Sweeping/vacuuming	\$72.80	9,148	1,200	240	\$17	\$17

Exhibit B2-1: Detailed Housekeeping and Maintenance Cost Savings by Type of Establishment
Continued

	Potential Savings (per 1000 sq ft)	Total Area (million square feet)	Portion Expected to Report Savings	Applicable Area	Total Expected Savings (millions of dollars)	Total Expected Savings (millions of dollars)
EDUCATION, continued						
Maintenance/Repair/Replacements						
Administrative/Office Space:						
Replace Office Furniture	\$271.80	9,148	1,200	600		\$163
Carpet Repairs	\$100.00	9,148	1,200	600		\$60
Painting	\$150.48	9,148	1,200	600		\$78
TOTAL					\$180	\$461
MERCANTILE AND SERVICES						
Cleaning:						
Empty and dump waste ashtrays	\$163.62	13,167	7,884	3,158		\$516
Sweeping/Vacuuming	\$72.80	13,167	7,884	3,158		\$230
Maintenance/Repair/Replacements:						
Carpet Repairs	\$100.00	13,167	7,884	3,158		\$316
Painting	\$104.36	13,167	7,884	3,158		\$165
TOTAL					\$611	\$1,227
LODGING						
Cleaning:						
Common Area: Empty and dump waste ashtrays	\$127.76	2,865	1,713	343		\$0
Guest Room (including: General Cleaning (per room))	\$246.28	8,053,000	3,031,800	1,263,250		\$310
Maintenance/Repair/Replacements:						
Common Area: Carpet Repairs	\$100.00	2,865	1,713	343		\$0
Common Area: Painting (per 1000 sq ft)	\$86.99	8,053,000	3,031,800	1,263,250		\$15
Guest Room (including: Replace Furniture (per room))	\$127.60	8,053,000	3,031,800	1,263,250		\$181
Guest Rooms (including: Carpet Repairs (per room))	\$100.00	8,053,000	3,031,800	1,263,250		\$128
Guest Rooms (including: Painting (per room))	\$43.48	8,053,000	3,031,800	1,263,250		\$55
TOTAL					\$15	\$667
WAREHOUSE/INDUSTRIAL						
Cleaning:						
Administrative Space:						
Empty and dump waste ashtrays	\$87.60	12,263	7,362	1,470		\$128
Dusting Desks	\$82.84	12,263	7,362	1,470		\$83
Empty and dump waste ashtrays	\$26.20	12,263	7,362	1,470		\$27
Painting	\$11.60	12,263	7,362	1,470		\$6
Windows/Horizontal Blinds	\$4.80	12,263	7,362	1,470		\$6
Clean HVAC Vents	\$0.00	12,263	7,362	1,470		\$0

Exhibit B3-1: Detailed Housekeeping and Maintenance Cost Savings by Type of Establishment
Continued

WAREHOUSE/INDUSTRIAL, continued

Production Areas:

Empty and damp wipe savings

Sweeping

TOTAL

Potential Savings (per 1000 sq ft)	Total Area (million square feet)	Portion Expected to Report Savings	Applicable Area	Total Expected Savings (millions of dollars)
\$87.50	12,253	7,352	5,881	\$615
\$39.40	12,253	7,352	5,881	\$214
				\$805

FOOD SERVICE

Cleaning:

Empty and damp wipe savings

Maintenance/Repair/Replacements:

Revised Tents and other set

Carpet Repairs

Painting (per 1000 sq feet)

TOTAL

Potential Savings (per 1000 sq ft)	Total Area (million square feet)	Portion Expected to Report Savings	Applicable Area	Total Expected Savings (millions of dollars)
\$85.70	27,753,000	22,202,400	6,860,720	\$438
\$26.85	27,753,000	22,202,400	6,860,720	\$179
\$10.00	27,753,000	22,202,400	6,860,720	\$67
\$98.99	1,187	700	700	\$0
				\$683

OFFICES

Cleaning:

Empty and damp wipe savings

Dusting Outlets

High Dusting

Veneer/Horizontal Blinds

Clean HVAC Vents

Maintenance/Repair/Replacements:

Repairs Office Furniture

Carpet Repairs

Painting

Computer Maintenance (seminars)

Computer Keyboard Replacement (seminars)

TOTAL

Potential Savings (per 1000 sq ft)	Total Area (million square feet)	Portion Expected to Report Savings	Applicable Area	Total Expected Savings (millions of dollars)
\$87.50	11,802	7,081	7,081	\$620
\$82.84	11,802	7,081	7,081	\$446
\$26.20	11,802	7,081	7,081	\$178
\$1.40	11,802	7,081	7,081	\$10
\$4.20	11,802	7,081	7,081	\$30
\$271.80	11,802	7,081	7,081	\$1,028
\$100.00	11,802	7,081	7,081	\$708
\$130.48	11,802	6,810	6,810	\$883
				\$3,044
\$21.25	26,430,000	6,857,500	6,857,500	\$141
\$23.50	26,430,000	6,857,500	6,857,500	\$166
				\$2,146
				\$8,077

Examples of

Discounting Methodology

Exhibit B4-1: Value of Reduced Absenteeism

	Years						2009 *
	1991-2000	2001-2010	2011-2020	2021-2030	2031-2040	2041-2050	
6% Discount Rate							
Quality (Age Estimates)	1.50	1.50	0.97	1.04	1.74	0.12	0.00
Number Persons (billions)	0.76	0.77	0.66	0.44	0.38	0.11	0.00
Reduced Absenteeism Days	60.77	60.56	60.10	45.81	23.42	0.00	0.00
Value	0.00000304	0.041801647	0.277600549	0.355332500	0.204328612	0.100707171	0.164370046
Discount Factor	1.00	0.90	0.81	0.73	0.66	0.59	0.53
Number Years Present	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Present Value	0.00074	0.117	0.225	0.249	0.135	0.059	0.087
Am. Equivalent Value (\$ Bill.)							1.776
Am. Equivalent Value (\$ Bill.)							9.9
7% Discount Rate							
Quality (Age Estimates)	0.81	0.80	0.67	1.04	1.74	0.12	0.00
Number Persons (billions)	0.80	0.80	1.14	0.03	0.40	0.10	0.00
Reduced Absenteeism Days	11.77	11.77	11.77	11.77	11.77	11.77	11.77
Value	0.00000304	0.041801647	0.277600549	0.355332500	0.204328612	0.100707171	0.164370046
Discount Factor	1.00	0.90	0.81	0.73	0.66	0.59	0.53
Number Years Present	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Present Value	0.00074	0.117	0.225	0.249	0.135	0.059	0.087
Am. Equivalent Value (\$ Bill.)							1.776
Am. Equivalent Value (\$ Bill.)							9.9
8% Discount Rate							
Quality (Age Estimates)	0.81	0.80	0.67	1.04	1.74	0.12	0.00
Number Persons (billions)	0.80	0.80	1.14	0.03	0.40	0.10	0.00
Reduced Absenteeism Days	11.77	11.77	11.77	11.77	11.77	11.77	11.77
Value	0.00000304	0.041801647	0.277600549	0.355332500	0.204328612	0.100707171	0.164370046
Discount Factor	1.00	0.90	0.81	0.73	0.66	0.59	0.53
Number Years Present	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Present Value	0.00074	0.117	0.225	0.249	0.135	0.059	0.087
Am. Equivalent Value (\$ Bill.)							1.776
Am. Equivalent Value (\$ Bill.)							9.9
9% Discount Rate							
Quality (Age Estimates)	0.81	0.80	0.67	1.04	1.74	0.12	0.00
Number Persons (billions)	0.80	0.80	1.14	0.03	0.40	0.10	0.00
Reduced Absenteeism Days	11.77	11.77	11.77	11.77	11.77	11.77	11.77
Value	0.00000304	0.041801647	0.277600549	0.355332500	0.204328612	0.100707171	0.164370046
Discount Factor	1.00	0.90	0.81	0.73	0.66	0.59	0.53
Number Years Present	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Present Value	0.00074	0.117	0.225	0.249	0.135	0.059	0.087
Am. Equivalent Value (\$ Bill.)							1.776
Am. Equivalent Value (\$ Bill.)							9.9
10% Discount Rate							
Quality (Age Estimates)	0.81	0.80	0.67	1.04	1.74	0.12	0.00
Number Persons (billions)	0.80	0.80	1.14	0.03	0.40	0.10	0.00
Reduced Absenteeism Days	11.77	11.77	11.77	11.77	11.77	11.77	11.77
Value	0.00000304	0.041801647	0.277600549	0.355332500	0.204328612	0.100707171	0.164370046
Discount Factor	1.00	0.90	0.81	0.73	0.66	0.59	0.53
Number Years Present	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Present Value	0.00074	0.117	0.225	0.249	0.135	0.059	0.087
Am. Equivalent Value (\$ Bill.)							1.776
Am. Equivalent Value (\$ Bill.)							9.9

Note: EPA uses age and income data discounting physical effects with age and income elasticity of 0.50 years estimated from any means. Only monetary values should be discounted. Discounting physical effects to zero is done only for analytic convenience and to display discounting methodology.

Exhibit B4-3: Premature Deaths Avoided (PDA) From Quitting by Years of Abstinence

Year	Age	Discrete	1997 to 2000		2001 to 2005		2006 to 2010		2011 to 2015		2016 to 2020		2021 to 2025		2026 to 2030		2031 to 2035		2036 to 2040		2041 to 2045		2046 to 2050		2051 to 2055		2056 to 2060		2061 to 2065		2066 to 2070		2071 to 2075		2076 to 2080		2081 to 2085		2086 to 2090		2091 to 2095		2096 to 2100		2101 to 2105		2106 to 2110		2111 to 2115		2116 to 2120		2121 to 2125		2126 to 2130		2131 to 2135		2136 to 2140		2141 to 2145		2146 to 2150		2151 to 2155		2156 to 2160		2161 to 2165		2166 to 2170		2171 to 2175		2176 to 2180		2181 to 2185		2186 to 2190		2191 to 2195		2196 to 2200		2201 to 2205		2206 to 2210		2211 to 2215		2216 to 2220		2221 to 2225		2226 to 2230		2231 to 2235		2236 to 2240		2241 to 2245		2246 to 2250		2251 to 2255		2256 to 2260		2261 to 2265		2266 to 2270		2271 to 2275		2276 to 2280		2281 to 2285		2286 to 2290		2291 to 2295		2296 to 2300		2301 to 2305		2306 to 2310		2311 to 2315		2316 to 2320		2321 to 2325		2326 to 2330		2331 to 2335		2336 to 2340		2341 to 2345		2346 to 2350		2351 to 2355		2356 to 2360		2361 to 2365		2366 to 2370		2371 to 2375		2376 to 2380		2381 to 2385		2386 to 2390		2391 to 2395		2396 to 2400		2401 to 2405		2406 to 2410		2411 to 2415		2416 to 2420		2421 to 2425		2426 to 2430		2431 to 2435		2436 to 2440		2441 to 2445		2446 to 2450		2451 to 2455		2456 to 2460		2461 to 2465		2466 to 2470		2471 to 2475		2476 to 2480		2481 to 2485		2486 to 2490		2491 to 2495		2496 to 2500		2501 to 2505		2506 to 2510		2511 to 2515		2516 to 2520		2521 to 2525		2526 to 2530		2531 to 2535		2536 to 2540		2541 to 2545		2546 to 2550		2551 to 2555		2556 to 2560		2561 to 2565		2566 to 2570		2571 to 2575		2576 to 2580		2581 to 2585		2586 to 2590		2591 to 2595		2596 to 2600		2601 to 2605		2606 to 2610		2611 to 2615		2616 to 2620		2621 to 2625		2626 to 2630		2631 to 2635		2636 to 2640		2641 to 2645		2646 to 2650		2651 to 2655		2656 to 2660		2661 to 2665		2666 to 2670		2671 to 2675		2676 to 2680		2681 to 2685		2686 to 2690		2691 to 2695		2696 to 2700		2701 to 2705		2706 to 2710		2711 to 2715		2716 to 2720		2721 to 2725		2726 to 2730		2731 to 2735		2736 to 2740		2741 to 2745		2746 to 2750		2751 to 2755		2756 to 2760		2761 to 2765		2766 to 2770		2771 to 2775		2776 to 2780		2781 to 2785		2786 to 2790		2791 to 2795		2796 to 2800		2801 to 2805		2806 to 2810		2811 to 2815		2816 to 2820		2821 to 2825		2826 to 2830		2831 to 2835		2836 to 2840		2841 to 2845		2846 to 2850		2851 to 2855		2856 to 2860		2861 to 2865		2866 to 2870		2871 to 2875		2876 to 2880		2881 to 2885		2886 to 2890		2891 to 2895		2896 to 2900		2901 to 2905		2906 to 2910		2911 to 2915		2916 to 2920		2921 to 2925		2926 to 2930		2931 to 2935		2936 to 2940		2941 to 2945		2946 to 2950		2951 to 2955		2956 to 2960		2961 to 2965		2966 to 2970		2971 to 2975		2976 to 2980		2981 to 2985		2986 to 2990		2991 to 2995		2996 to 3000		3001 to 3005		3006 to 3010		3011 to 3015		3016 to 3020		3021 to 3025		3026 to 3030		3031 to 3035		3036 to 3040		3041 to 3045		3046 to 3050		3051 to 3055		3056 to 3060		3061 to 3065		3066 to 3070		3071 to 3075		3076 to 3080		3081 to 3085		3086 to 3090		3091 to 3095		3096 to 3100		3101 to 3105		3106 to 3110		3111 to 3115		3116 to 3120		3121 to 3125		3126 to 3130		3131 to 3135		3136 to 3140		3141 to 3145		3146 to 3150		3151 to 3155		3156 to 3160		3161 to 3165		3166 to 3170		3171 to 3175		3176 to 3180		3181 to 3185		3186 to 3190		3191 to 3195		3196 to 3200		3201 to 3205		3206 to 3210		3211 to 3215		3216 to 3220		3221 to 3225		3226 to 3230		3231 to 3235		3236 to 3240		3241 to 3245		3246 to 3250		3251 to 3255		3256 to 3260		3261 to 3265		3266 to 3270		3271 to 3275		3276 to 3280		3281 to 3285		3286 to 3290		3291 to 3295		3296 to 3300		3301 to 3305		3306 to 3310		3311 to 3315		3316 to 3320		3321 to 3325		3326 to 3330		3331 to 3335		3336 to 3340		3341 to 3345		3346 to 3350		3351 to 3355		3356 to 3360		3361 to 3365		3366 to 3370		3371 to 3375		3376 to 3380		3381 to 3385		3386 to 3390		3391 to 3395		3396 to 3400		3401 to 3405		3406 to 3410		3411 to 3415		3416 to 3420		3421 to 3425		3426 to 3430		3431 to 3435		3436 to 3440		3441 to 3445		3446 to 3450		3451 to 3455		3456 to 3460		3461 to 3465		3466 to 3470		3471 to 3475		3476 to 3480		3481 to 3485		3486 to 3490		3491 to 3495		3496 to 3500		3501 to 3505		3506 to 3510		3511 to 3515		3516 to 3520		3521 to 3525		3526 to 3530		3531 to 3535		3536 to 3540		3541 to 3545		3546 to 3550		3551 to 3555		3556 to 3560		3561 to 3565		3566 to 3570		3571 to 3575		3576 to 3580		3581 to 3585		3586 to 3590		3591 to 3595		3596 to 3600		3601 to 3605		3606 to 3610		3611 to 3615		3616 to 3620		3621 to 3625		3626 to 3630		3631 to 3635		3636 to 3640		3641 to 3645		3646 to 3650		3651 to 3655		3656 to 3660		3661 to 3665		3666 to 3670		3671 to 3675		3676 to 3680		3681 to 3685		3686 to 3690		3691 to 3695		3696 to 3700		3701 to 3705		3706 to 3710		3711 to 3715		3716 to 3720		3721 to 3725		3726 to 3730		3731 to 3735		3736 to 3740		3741 to 3745		3746 to 3750		3751 to 3755		3756 to 3760		3761 to 3765		3766 to 3770		3771 to 3775		3776 to 3780		3781 to 3785		3786 to 3790		3791 to 3795		3796 to 3800		3801 to 3805		3806 to 3810		3811 to 3815		3816 to 3820		3821 to 3825		3826 to 3830		3831 to 3835		3836 to 3840		3841 to 3845		3846 to 3850		3851 to 3855		3856 to 3860		3861 to 3865		3866 to 3870		3871 to 3875		3876 to 3880		3881 to 3885		3886 to 3890		3891 to 3895		3896 to 3900		3901 to 3905		3906 to 3910		3911 to 3915		3916 to 3920		3921 to 3925		3926 to 3930		3931 to 3935		3936 to 3940		3941 to 3945		3946 to 3950		3951 to 3955		3956 to 3960		3961 to 3965		3966 to 3970		3971 to 3975		3976 to 3980		3981 to 3985		3986 to 3990		3991 to 3995		3996 to 4000		4001 to 4005		4006 to 4010		4011 to 4015		4016 to 4020		4021 to 4025		4026 to 4030		4031 to 4035		4036 to 4040		4041 to 4045		4046 to 4050		4051 to 4055		4056 to 4060		4061 to 4065		4066 to 4070		4071 to 4075		4076 to 4080		4081 to 4085		4086 to 4090		4091 to 4095		4096 to 4100		4101 to 4105		4106 to 4110		4111 to 4115		4116 to 4120		4121 to 4125		4126 to 4130		4131 to 4135		4136 to 4140		4141 to 4145		4146 to 4150		4151 to 4155		4156 to 4160		4161 to 4165		4166 to 4170		4171 to 4175		4176 to 4180		4181 to 4185		4186 to 4190		4191 to 4195		4196 to 4200		4201 to 4205		4206 to 4210		4211 to 4215		4216 to 4220		4221 to 4225		4226 to 4230		4231 to 4235		4236 to 4240		4241 to 4245		4246 to 4250		4251 to 4255		4256 to 4260		4261 to 4265		4266 to 4270		4271 to 4275		4276 to 4280		4281 to 4285		4286 to 4290		4291 to 4295		4296 to 4300		4301 to 4305		4306 to 4310		4311 to 4315		4316 to 4320		4321 to 4325		4326 to 4330		4331 to 4335		4336 to 4340		4341 to 4345		4346 to 4350		4351 to 4355		4356 to 4360		4361 to 4365		4366 to 4370		4371 to 4375		4376 to 4380		4381 to 4385		4386 to 4390		4391 to 4395		4396 to 4400		4401 to 4405		4406 to 4410		4411 to 4415		4416 to 4420		4421 to 4425		4426 to 4430		4431 to 4435		4436 to 4440		4441 to 4445		4446 to 4450		4451 to 4455		4456 to 4460		4461 to 4465		4466 to 4470		4471 to 4475		4476 to 4480		4481 to 4485		4486 to 4490		4491 to 4495		4496 to 4500		4501 to 4505		4506 to 4510		4511 to 4515		4516 to 4520		4521 to 4525		4526 to 4530		4531 to 4535		4536 to 4540		4541 to 4545		4546 to 4550		4551 to 4555		4556 to 4560		4561 to 4565		4566 to 4570		4571 to 4575		4576 to 4580		4581 to 4585		4586 to 4590		4591 to 4595		4596 to 4600		4601 to 4605		4606 to 4610		4611 to 4615		4616 to 4620		4621 to 4625		4626 to 4630		4631 to 4635		4636 to 4640		4641 to 4645		4646 to 4650		4651 to 4655		4656 to 4660		4661 to 4665		4666 to 4670		4671 to 4675		4676 to 4680		4681 to 4685		4686 to 4690		4691 to 4695		4696 to 4700		4701 to 4705		4706 to 4710		4711 to 4715		4716 to 4720		4721 to 4725		4726 to 4730		4731 to 4735		4736 to 4740		4741 to 4745		4746 to 4750		4751 to 4755		4756 to 4760		4761 to 4765		4766 to 4770		4771 to 4775		4776 to 4780		4781 to 4785		4786 to 4790		4791 to 4795		4796 to 4800		4801 to 4805		4806 to 4810		4811 to 4815		4816 to 4820		4821 to 4825		4826 to 4830		4831 to 4835		4836 to 4840		4841 to 4845		4846 to 4850		4851 to 4855		4856 to 4860		4861 to 4865		4866 to 4870		4871 to 4875		4876 to 4880		4881 to 4885		4886 to 4890		4891 to 4895		4896 to 4900		4901 to 4905		4906 to 4910		4911 to 4915		4916 to 4920		4921 to 4925		4926 to 4930		4931 to 4935		4936 to 4940		4941 to 4945		4946 to 4950		4951 to 4955		4956 to 4960		4961 to 4965		4966 to 4970		4971 to 4975		4976 to 4980		4981 to 4985		4986 to 4990		4991 to 4995		4996 to 5000		5001 to 5005		5006 to 5010		5011 to 5015		5016 to 5020		5021 to 5025		5026 to 5030		5031 to 5035		5036 to 5040		5041 to 5045		5046 to 5050		5051 to 5055		5056 to 5060		5061 to 5065		5066 to 5070		5071 to 5075		5076 to 5080		5081 to 5085		5086 to 5090		5091 to 5095		5096 to 5100		5101 to 5105		5106 to 5110		5111 to 5115		5116 to 5120		5121 to 5125		5126 to 5130		5131 to 5135		5136 to 5140		5141 to 5145		5146 to 5150		5151 to 5155		5156 to 5160		5161 to 5165		5166 to 5170		5171 to 5175		5176 to 5180		5181 to 5185		5186 to 5190		5191 to 5195		5196 to 5200		5201 to 5205		5206 to 5210		5211 to 5215		5216 to 5220		5221 to 5225		5226 to 5230		5231 to 5235		5236 to 5240		5241 to 5245		5246 to 5250		5251 to 5255		5256 to 5260		5261 to 5265		5266 to 5270		5271 to 5275		5276 to 5280		5281 to 5285		5286 to 5290		5291 to 5295		5296 to 5300		5301 to 5305		5306 to 5310		5311 to 5315		5316 to 5320		5321 to 5325		5326 to 5330		5331 to 5335		5336 to 5340		5341 to 5345		5346 to 5350		5351 to 5355		5356 to 5360		5361 to 5365		5366 to 5370		5371 to 5375		5376 to 5380		5381 to 5385		5386 to 5390		5391 to 5395		5396 to 5400		5401 to 5405		5406 to 5410		5411 to 5415		5416 to 5420		5421 to 5425	
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Figure 8-8: Premature Deaths Avoided From Reduced Consumption Economic Restrictions

[illegible]

Note: EPA does not believe that discounting physical effects such as premature deaths or live years extended has any meaning. Discounted physical effects is done above only for analytic convenience and to display discounting methodology. Only monetary values should be

Mr. WAXMAN. I would like to now call forward the present and former Surgeons General for the last 25 years. First, Dr. M. Joycelyn Elders, Surgeon General at the present time; Antonia C. Novello, Surgeon General, 1990 to 1993; C. Everett Koop, Surgeon General, 1981 to 1989; Julius B. Richmond, 1977 to 1981; S. Paul Ehrlich, 1973 to 1977; and Jesse L. Steinfeld, 1969 to 1973.

I want to welcome all of you here today. Your appearance jointly is unprecedented. This is the first time we have ever had all the Surgeons General together in one place. It is a testament to your commitment to protect the public in the severe hazards posed by environmental tobacco smoke.

You represent the unbroken chain of Surgeons General of the last 25 years, 4 Republicans, as I understand the breakdown, 4 Republicans and 2 Democrats. It is the first time you have ever been before Congress together. And it is interesting to note that Surgeon General is one of the toughest jobs in town, particularly when it comes to dealing with this tobacco issue.

Dr. Steinfeld, at the beginning of President Nixon's second term, the CEO of R.J. Reynolds asked the President to fire you for your efforts to reduce tobacco use.

Dr. Koop, your courage in taking on this issue is well-known.

At various times, each of you has probably had on your mind what the reaction would be of the tobacco industry for your efforts to fight tobacco and the consequences of tobacco in terms of human health. But each of you persevered, armed with the confidence gained in the commitment to public health, adherence to the scientific truth and the faith that reducing premature death and serious illness is a fight worth fighting.

The Nation is grateful to all of you for your efforts in the past, and again, for being here today.

Dr. Koop, I understand you have a plane to catch, so at some point during the testimony of the others or the questions, if you have to slip out, we will certainly understand.

Dr. Elders, you are our present Surgeon General, and you are here speaking on behalf of this administration.

STATEMENTS OF M. JOYCELYN ELDERS, SURGEON GENERAL, PUBLIC HEALTH SERVICE, AND FORMER SURGEONS GENERAL ANTONIA C. NOVELLO (1990-1993), C. EVERETT KOOP (1981-1989), JULIUS B. RICHMOND (1977-1981), S. PAUL EHR- LICH, JR. (1973-1977), AND JESSE L. STEINFELD (1969-1973)

Ms. ELDERS. Thank you, Chairman Waxman, members of the subcommittee. I am pleased to be here this morning standing on the shoulders of the 15 previous Surgeons General as well as the 5 present Surgeons General who are sitting here at the table with me. I want to thank you for allowing me the opportunity of meeting the other Surgeons General.

I am also delighted to appear before this subcommittee to talk about one topic that we can discuss without any debate about the facts: the impact of secondhand or environmental smoke on our children.

Picture with me for a moment a roomful of preschoolers, each with a cigarette in their mouth. In essence, this is what we are doing to our children every time we expose them to secondhand

smoke. It has toxic and carcinogenic effects that are very similar to mainstream smoke.

When we smoke around our children, then our children are smoking. Indeed, we are all affected by secondhand smoke. Asthma, bronchial problems, and the future risk of lung cancer are as real in adults as they are in children.

But the fact is children, especially young children, are more vulnerable to this harm. Not only are they physically vulnerable, but our children are also vulnerable because they are held captive to adult management of their spaces. Unlike adults, they cannot negotiate for smoke-free environments, and unlike adults, they cannot simply get up and leave. Our children have no choices except those we give them.

Let me review a few of the facts. Nine million American children under the age of 5 are exposed to secondhand smoke in their homes. Nearly 800,000 children in the United States are exposed to secondhand smoke in their child care centers or schools. Many other children each day are forced to breathe air polluted with cigarette smoke in automobiles, shopping malls and restaurants, particularly fast-food restaurants that cater to children.

Exposure to secondhand smoke causes up to 300,000 lower respiratory tract infections each year in children less than 18 months of age, as you have heard. These needless infections can result in up to 15,000 hospitalizations yearly. Environmental tobacco smoke is a risk factor for asthma and causes increased severity of symptoms in children with asthma.

A recent study from the Center for Disease Control and Prevention's National Center for Health Statistics found that infants are three times more likely to die of SIDS if their mother smoked during pregnancy and continued the smoking; one and a half times more likely if their mother smoked and they stopped smoking during pregnancy but resumed smoking afterwards.

Secondhand smoke affects children their entire lives. As adults they may face an increased risk of developing lung cancer if they grow up in a home with a smoker. In January 1993, environmental tobacco smoke joined asbestos, benzene, and vinyl chloride as a "Group A" carcinogen. These are carcinogens *for which no safe level of exposure has been established*. ETS contains 43 chemicals that have been determined to be carcinogenic, many of which are treated as hazardous when emitted by toxic waste dumps and chemical plants. An estimated 3,000 lung cancer deaths in healthy non-smokers are caused each year by ETS.

Recently you heard about the risks of secondhand smoke in fast-food restaurants or places where children eat and play. I am alarmed by the concentration of secondhand smoke in these places. Exposure to secondhand smoke in restaurants that allow smoking is one and a half to two times greater than in other workplace settings that allow smoking such as offices. Exposure to secondhand smoke in restaurants is 1½ times greater than in homes where at least one parent smokes.

Restaurant workers, who are usually adolescents, have a 50 to 90 percent increase in lung cancer risk due to their exposure to secondhand smoke. They are one and a half times as likely to develop lung cancer than if they worked in a smoke-free environment.

The States attorneys general from 17 States have issued recommendations to fast-food restaurant chains to adopt smoke-free policies as soon as possible, and I am pleased to see that companies like Arby's, Bess Eaton Donuts, and Dairy Queen have banned smoking. I look forward to hearing about more and more public places going smoke free, including malls, stores like Sears, which is smoke free, schools and homes.

According to Congressman Waxman's letter, this hearing is about appropriate Federal policies regarding secondhand smoke. I have maintained that our first order of business is to share these alarming facts with every parent in this country. No parent would willingly expose their children to any danger and secondhand smoke is undeniably a danger.

This is not a question of a human or civil right to do what you want when you want. No, this is a question of protecting our children from out-and-out peril. Our 30 years of experience with tobacco prevention has taught us that this fact sharing must be accompanied by community-based education and behavior changes and by reinforcements at every level.

Unfortunately, we cannot give up that drumbeat for smoking either. I was deeply troubled by the recent survey released showing that our 8th, 10th and 12th graders are smoking more now than they did last year. There is evidence the attitudes of these youngsters toward tobacco are softening. Perhaps they perceive less risk, increased availability, and what I find most disturbing, increased glamour and attractiveness of those who smoke.

Clearly, we have a big job to do to change those attitudes in our youngest citizens, the group that constitutes almost all the new smokers in our country. The tobacco industry needs to recruit 3,000 new smokers a day to replace those who quit smoking or die from smoking. And, sadly, most of those new recruits are young people.

We support the bill and look forward to working with the subcommittee over specific concerns as the bill is debated.

Thank you.

Mr. WAXMAN. Thank you very much, Dr. Elders.

Dr. Novello?

STATEMENT OF ANTONIA C. NOVELLO

Ms. NOVELLO. Good morning, and thank you for allowing me to provide my personal testimony on the health effects of tobacco use and exposure to environmental tobacco smoke.

The issue of environmental tobacco smoke is one of the most sensitive and far-reaching issues of our time, and I am honored to be with you here this morning not only because I share the floor with the former Surgeons General, but most importantly because this committee is reviewing this critical public health matter especially as it relates to the children, and I believe that it is our moral duty to assist you.

It is well-known that the tobacco industry constantly bombards children in this country with the enticing message that smoking is fun, that smoking is glamorous, and that smoking is cool, but never with a hint at the consequences of such behavior. We must remember that each year the tobacco industry must replenish the ones who die, nearly half a million, of the consequences of smoking-re-

lated diseases and the 1 million who quit. What better target than the young impressionable minds of our children.

I might almost be inclined to compare the selling attitude of the tobacco industry to the use of credit cards. Smoke now, pay later, with the interest that is accrued not charged every month, but is absolutely day after day, and the final statement is disability and death—disability and death that absolutely is preventable.

As a former Surgeon General between 1990 and 1993, and now the UNICEF Representative for Health and Nutrition in charge of preventing smoking in youth, I can tell you that I must resound the alarm about secondhand smoking in the air we breathe and the prevalence of smoking in this country is too much. It seems to me that we have mentioned it but a little more mention is never unwarranted.

We know that almost 419,000 Americans die every year from smoking-related causes. This means more than one death every six deaths in the United States. In the United States we know that the danger is so well documented that all of us know that the tobacco products must carry a federally mandated warning.

In the United States every year it has been said 3,000 children start to smoke by the 4th grade and by the 10th grade, $\frac{2}{3}$ have already started smoking. And by the time they are 21, 90 percent are already hooked on nicotine. In fact, 75 percent of smokers begin to smoke before the age of 18, and we estimate that if 20 million of the 70 million children now living in the United States smoked cigarettes, at least 5 million will die of smoking-related diseases.

I am sure the industry knows of this data and I am equally sure that they understand the significance. But for all efforts in data collection, scientific analysis and education, we might as well be sending out smoke signals. Because the facts regarding health have still not filtered through the tobacco industry's greed.

Each year, you see, the tobacco industry spends \$4 billion on cigarette advertising and promotion. And that is \$4 billion, let me remind you, that is tax deductible as a cost of doing business and is subsidized by the American public. Each year the industry garners \$221 million in profits from illegal sales to children and each year the industry tells us they advertise only to promote brand loyalty. May I remind you that brand awareness in early childhood translates to brand preference in adulthood.

I can tell you that if the industry were really serious about their concerns for children, they would restrict their advertising to adults, and then take extra precautions to restrict advertising that caters to children in magazines they read, in clothes they wear, and in the places they gather. That is why I am here today. And I can tell you my comments will be focused on children and the effects of environmental tobacco on their lives and well-being.

We heard this morning that the EPA still maintains passive smoke is responsible for 150,000 to 300,000 lower respiratory tract infections in children under the age of 18 months, resulting in 7,500 to 15,000 hospitalizations each year. Children of parents who smoke have an increased frequency of a variety of acute respiratory syndromes.

Children exposed to secondhand smoke are also more likely to have reduced lung function and symptoms of respiratory infections,

such as wheezing, phlegm and cough. Passive smoking by children we have also heard accumulates fluid in the middle ear, which all pediatricians know about that.

In addition, ETS increases the episodes of increased severity of respiratory symptoms in asthmatic children. And we are talking about 200,000 to 1 million asthmatics having their condition worsened by the presence of passive smoke. And when a mother smokes at least 10 cigarettes a day, she can be responsible between 8,000 to 26,000 new cases of asthma among her children a year. And we know, as it has been said before, that maternal smoking is associated with sudden infant death syndrome, the major cause of death of infants between 1 month and 1 year of age.

Yet, in the presence of all the facts that we have heard today and before, I am very concerned that smoking goes on without any regard for children's health in the public places they gather. Every year in this country millions of American children spend time in public places as fast-food restaurants, schools, day care facilities; they eat, they play, they learn and they are on playgrounds, but most importantly, working behind the counters of fast-food restaurants, because smoking is permitted in almost all of these facilities, these children are exposed to passive smoke, a class A carcinogen, for which no safe level of exposure has been established.

By industry estimates, as many as 25 percent of fast-food restaurant customers are under the age of 18, 10 percent under the age of 10, and 40 percent of employees in the fast-food restaurants are below the age of 18 as well.

A review article in *The Journal of the American Medical Association* demonstrated that levels of secondhand smoke in restaurants are much higher than in any other place where people work, including the home. We are talking about two times higher than in most offices and 1.5 times higher than in homes where at least one smoker resides.

Similarly, it has been shown that nearly 800,000 children, or 19 percent of children age 5 and under attending day care centers, are at risk for exposures of passive inhalation.

Furthermore, according to the National School Boards Association, although 77 percent of America's public schools have some smoking restrictions, only 17 percent are totally smoke free.

Despite such a body of expanding scientific evidence documenting the effects of tobacco use, the tobacco industry continues to denounce the health findings of both smoking and secondhand smoke, and in spite of all the efforts, we are still unable to fully convince American parents that their children are at risk regarding tobacco, not only now but for the future as well.

For years the industry contended that the science is inconclusive, and yet the scientific findings substantiating the health effects of tobacco and secondhand smoke are indisputably credible and are recognized throughout the world as such in the scientific community to be good science and good standards.

We should all be concerned about secondhand smoke in public places, and I will tell you why. First, millions of Americans spend approximately 90 percent of their time indoors, either at the place they work or at their homes. For many of these people, it means

exposure to toxins such as benzene, formaldehyde, cyanide, carbon monoxide, ammonia, and/or nicotine found in secondhand smoke.

EPA estimates secondhand smoke is responsible for approximately 45,000 deaths annually in known smokers in the United States. EPA estimates that about 20 to 30 percent of all lung cancers in nonsmokers are attributable to environmental tobacco smoke. The increased lung cancer risk associated with exposure to environmental tobacco smoke are at least an order of magnitude greater than the cancer risks for virtually any other chemical or agent EPA regulates.

The risk of lung cancer to nonsmokers that grow up as children in smoking households is double that of smoking adults who grew up in houses of nonsmokers.

As has been said before, a recent study of the Centers for Disease Control regarding secondhand tobacco smoke in the workplace showed that more than 28 million Americans today work in locations that permit smoking in designated and other areas. However, of these workers exposed to secondhand tobacco smoke, 12 million report that some moderate discomforts and 4.5 million report great discomfort from such exposure.

Today I want to say we are not alone in the fight against environmental tobacco smoke because in 1990 Gallup found that 90 percent of those surveyed favored restricted or banning smoking in public places, with 94 percent supporting a smoking ban in the working place.

I am also encouraged to see that the number of private companies adopting smoking policies has grown dramatically over the last 10 years. By 1992, 85 percent of private companies had adopted policies to restrict or ban smoking in the workplace, 34 percent of these policies were total bans and 59 percent of work sites with 50 or more employees had formal worksite smoking policies that prohibited or severely restricted smoking in 1992, up from 27 percent in 1985.

To date, 19 States have adopted public laws restricting smoking in private workplaces; and by 1992, 45 States had laws restricting smoking in public places. Let us have no doubt that smoking is preventable, which means that something can be done to eliminate this problem.

To reduce health risks, restrictions to prevent exposure must be more comprehensive than the current ones we have in place. Studies show that 75 percent of Americans do not smoke and I don't believe then that they should be exposed to the damage of passive inhalation.

You are the responsible citizens, and all of us too, entrusted with the care of the American public health. I can tell you it is imperative, after we hear the testimony of all the people here today, that you enact legislation for the elimination of environmental tobacco smoke in public places. By doing so you will have helped the American public and, in particular, the children, to regain their right to clean air.

Thank you very much and I will be ready to take questions.

Mr. WAXMAN. Thank you very much, Dr. Novello.

Dr. Koop.

STATEMENT OF C. EVERETT KOOP

Mr. KOOP. Thank you, Mr. Chairman.

I am C. Everett Koop. I was Surgeon General of the United States Public Health Service 1981 to 1989, and during my tenure, eight reports by the Surgeon General on smoking and health were submitted to this Congress. The 30th anniversary of the historic report of the advisory committees to the Surgeon General on the relationship of smoking to cancer of the lung in men allows us to appreciate at least three important long-term results of that famous report, released by Surgeon General Luther Terry just 3 decades ago.

First, in 1964 report initiated an intensive effort of American society to emancipate itself from the curse of tobacco use. In spite of the billions of dollars spent by the tobacco industry to promote its harmful products that spread death, disability and disease throughout American society, more and more Americans have been successful in quitting the addictive habit of smoking. In the last 30 years, we have seen a dramatic decrease in the percentage of Americans who smoke, from over half the adult population in 1964 to only a little more than a quarter today. Even though we still have too many people who smoke, and even though too many of our young children will smoke their first cigarette today, we have made real progress in reducing smoking, our primary preventable cause of disease and death. The 1964 report began what is perhaps the most dramatic public health success story of the 20th Century.

Second, the 1964 Surgeon General's report marked a new aggressiveness in the role of the Federal Government, especially the Office of the Surgeon General, in safeguarding the health of the American people. When I first assumed that office, I was very much aware of the integrity and influence my predecessors had brought to the position of Surgeon General, and I was determined to do all I could to uphold, not only the trust of the American people, but also the high standards of those who had held the Office of Surgeon General before me, those who had distinguished themselves in a high-profile position as official advocates for the health of the American people.

And third, the 1964 Surgeon General's report may have opened a new era in personal health promotion and disease prevention. As the United States struggles today with the larger problems of health care reform, it has become obvious that our old reliance upon therapeutic and rehabilitative medicine has become obsolete, that we must engender a new ethic of prevention to undergird our reformed health care system. This ethic of prevention means not only fewer people smoking, but we must also reduce the incidence of environmental tobacco smoke.

Eight years ago, as your Surgeon General, I reported this: It is now clear that the disease risk due to the inhalation of tobacco smoke is not limited to the individual who is smoking but can extend to those who inhale tobacco smoke emitted into the air. Then, as now, there were those who argued that certain studies are flawed, or that we should delay action until more conclusive proof is produced. I say now as I said nearly a decade ago, it is my judgment that the time for delay is passed. Measures to protect the public health are required now.

And in the 21st Century, Mr. Chairman, as health telecommunications systems bring vital health information and advice into individual homes, we Americans will increasingly be expected to take charge over our own health, a vital trend that has its roots in the Surgeon General's first report on smoking and health 30 years ago. It is a daunting but necessary challenge, but it is one that will be made easier for our lawmakers extend to each of us the modest right to work and to conduct business in a smoke-free environment.

I do support this legislation, sir, H.R. 3434, and I thank you, Mr. Chairman, for the manner in which you have chaired this subcommittee in the 13 years that I have had it under my close scrutiny. And I am especially appreciative of how you have kept the threat of tobacco on the health of the American people before our society.

During my tenure, smoke-free workplaces were introduced, and I worked with many companies, and the experiences were rather uniform. Workers who complained initially were eventually grateful. In appropriate settings, business improved. Absenteeism fell. Less money was spent on health care. Accidents dropped because three-quarters of the people involved in accidents at work sites are smokers. Cleaning and maintenance fell from costs sometimes as much as a half. Fire insurance costs went down, workers compensation eased and as workers stopped smoking, the benefits of smoke-free workplaces were extended to the family in the home.

I appreciate very much, Mr. Chairman, the opportunity to appear before you today. It does seem like old times. They say you cannot go back, but you invited me and here I am.

Thank you, sir.

Mr. WAXMAN. Thank you very much, Dr. Koop, and it is a special privilege for me to have you back again.

Dr. Richmond.

STATEMENT OF JULIUS B. RICHMOND

Mr. RICHMOND. Thank you, Mr. Chairman.

I, too, want to say it is a great privilege to have been invited by you, along with my colleagues, to testify on this legislation. I am Dr. Julius Richmond, and I served as Surgeon General and Assistant Secretary for Health in the Department of Health and Human Services from 1977 to 1981. I currently serve as the professor of health policy, Emeritus at the Harvard Medical School.

Mr. Chairman, let me first congratulate you on your work and that of your colleagues in introducing the Environmental Protection Agency's policies in the form of legislation through the Smoke-Free Environmental Act of 1993, H.R. 3434. I, along with my colleagues, can support it with great enthusiasm in the interest of improving the health of our people.

I was the Surgeon General, Mr. Chairman, when you became chairman of this Subcommittee on Health and the Environment, and I can't help but interject that I admire all of your efforts to improve our Nation's health, and I particularly commend you for the leadership you are now taking in this very important period in engaging in a real dialogue and providing leadership on the health care reform legislation.

It is not customary, Mr. Chairman, to introduce into the record a cartoon, but I do so because cartoonists, in this instance Mike Luckovich of the Atlanta Constitution, often capture the mood of the times. The cartoon, for those who do not have it before them, shows a man lighting a cigarette and saying to a woman standing next to him, "Pardon me, do you mind if I give you lung cancer?" And I mention this because cartoonists do have this way of capturing what is in the public domain, and I think what this illustrates is that the public understands very well the science that is behind this kind of legislation.

I also welcome this opportunity, Mr. Chairman, to set the record straight concerning the use of my Surgeon General's reports in 1979, which was on the 15th anniversary of the first Surgeon General's report on smoking and health. The tobacco industry has, on occasion, suggested that I am the Surgeon General who did not take a stand on secondhand smoke. So let me quote what I did say then:

"Attention to involuntary smoking is of recent vintage"—mind you, in 1979—"and only limited information regarding the health effects of such exposure upon the nonsmoker is available. Therefore, research is needed to define these effects."

Fortunately, Mr. Chairman, the scientific community took the challenge seriously and, as my successors have indicated, we now have abundant scientific data on the harmful health effects of secondhand smoke, and I would refer you particularly to Dr. Koop's report which he mentioned in 1986 on the health consequences of involuntary smoking.

Mr. Chairman, I also, as a pediatrician, would reinforce the concerns that we have heard today about the 150,000 to 300,000 cases of bronchitis and pneumonia, of infants and young children that occur each year, and that exacerbations of asthma attacks occur in 200,000 to 1 million children each year as a consequence of exposure to environmental tobacco smoke.

I would also like to call your attention to the studies of a group of my colleagues at the Channing Laboratory of the Harvard Medical School, which indicate that maternal cigarette smoke has important effects on the development of pulmonary function in children, significant reductions in pulmonary function in children who are exposed to maternal smoking.

I would also call your attention to bulletin 54 of the National Institute of Occupational Safety and Health of the Public Health Service which summarizes all of our data on environmental tobacco smoke in the workplace and highlights the adverse health effects comprehensively.

And, Mr. Chairman, I would hope that we could enlist all working men and women in this country in support of this legislation.

And, again, as a pediatrician, I would emphasize the effects of maternal smoking on the developing fetus. We have already heard some reference to this, but newborn infants born of smoking mothers are almost half a pound lighter than those born to nonsmoking mothers. And there are many suggestions now of neuro developmental consequences. This is a highly significant cause of low birth weight among infants. Therefore, Mr. Chairman, we must

place even more emphasis than we have heretofore on the cessation of smoking during pregnancy.

Mr. Chairman, I would again commend and your colleagues for having acted on the policies which have been announced by the Environmental Protection Agency, and we look forward to progress in this area.

Thank you.

Mr. WAXMAN. Thank you very much, Dr. Richmond, for your excellent statement.

If you would pass the microphone over, we will hear from Dr. Ehrlich

STATEMENT OF S. PAUL EHRLICH, JR.

Mr. EHRLICH. Mr. Chairman and members of the committee, I am pleased to be here along with my distinguished colleagues to add my perspective that secondhand smoke is perhaps one of the most poorly recognized public health problems in our country, and, indeed, in the world. I am here today to help make tobacco control a priority so that we can reach our goal of a smoke-free environment by the year 2000.

I would like to thank and commend the chairman for his leadership on this issue. His bill, H.R. 3434, the Smoke-Free Environment Act of 1993, will make a significant contribution to this goal.

When I had the responsibilities of the Surgeon General in the mid-1970's, smoking was considered a public health issue for the risk it posed to the individual. When an individual bought a pack of cigarettes, he or she probably knew of the potential hazards of smoking and made his or her decision accordingly.

Twenty years later, we consider smoking a public health issue for a different reason: Smoking is now recognized as an environmental health problem. No longer is the question of smoking only a matter of individual choice for now we know the deleterious effects of secondhand smoke.

I am pleased that the incidence of smoking has decreased since I served in the Office of the Surgeon General, but the fact that only 25 percent of Americans smoke compared to the 45 percent that smoked 20 years ago is not as significant when studies now show that three out of four nonsmokers are actually passive smokers.

Twenty years ago, I would have had to agree that the restrictive provisions of this bill would have violated a smoker's rights. But with the increasing evidence we have today concerning secondhand smoke, I can only support these restrictions, for without them, it is the nonsmoker's rights that are being violated.

In the past, we have seen how smoking restrictions have actually been met with public approval. When one airline first banned smoking on short flights, we all expected a public outcry. But now, just a few years later, all U.S. airlines have banned smoking on most domestic flights with little public resistance.

I expect this will be the case with H.R. 3434. Although this legislation may seem radical to some, many communities have already taken the bold steps embodied in this bill with promising results.

For example, in 1991, Palo Alto, Calif. banned smoking in all public places except bars. This ordinance came about incrementally. The city passed its first no smoking ordinance in 1974 when

it banned smoking in movie theaters. The movie house owners were very upset over this. One theatre owner actually showed a list of all the city council members who voted for the measure on the movie screen before every movie until he realized that the crowd cheered each time the list was shown.

Over the years, the city council added new restrictions to the city's smoking ordinance. Sure, there were naysayers along the way, like the theater owners. Restaurateurs were concerned when the city voted to ban smoking in restaurants, certain that the ordinance would hurt business. In fact, business has expanded greatly and the city's sales tax revenues have grown. Interestingly, the most recent strengthening of the city's no-smoking policy did not come from the city council; it came at the urging of the citizens of Palo Alto.

Mr. Chairman, given what we know about the public health hazards related to secondhand smoke, and in this environment of health reform, given what we know about smoking's contribution to our exploding health care costs, I can see no reason why this bill should not be enacted. It will significantly improve our Nation's public health without Federal expenditure or bureaucratic involvement.

Before closing, Mr. Chairman, I would like to mention two other pieces of pending legislation which will make additional important contributions in our efforts to control tobacco. The first is H.R. 3614, legislation which you have also introduced, which strengthens the Surgeon General's warnings on tobacco products and further restricts advertising and promotion which is particularly targeted at our youth.

The second is H.R. 3025, which restricts marketing practices and raises the low Federal tax on smokeless tobacco, whose use is growing more rapidly than any other tobacco product. Both of these bills include important educational elements to further strengthen our efforts to inform people of the serious health effects of tobacco in any form.

As you have said, Mr. Chairman, in 1994, the United States has the opportunity to assume world leadership in tobacco control. Tobacco is a global problem and I hope we can become the world's model for enhanced public health in this most important effort.

Thank you again, Mr. Chairman, for your outstanding leadership on this issue and for inviting me to testify before your subcommittee today.

Mr. WAXMAN. Thank you very much, Dr. Ehrlich, for that excellent statement.

Dr. Steinfeld?

STATEMENT OF JESSE L. STEINFELD

Mr. STEINFELD. Well, thank you, Mr. Chairman, for inviting me to join with the other Surgeons General in discussing the legislation which you have introduced. It is certainly a pleasure to renew old acquaintances and to meet two of the most recent Surgeons General who I have not met before.

I would like to offer a small correction for the record. You do not have four Republican and two Democratic Surgeons General; you

have four Surgeons General who served under Republican administrations and two who served under Democratic administrations.

As I sat here, I am reminded of something my daughter asked me and my response. She said, "What do you call yourself when you all get together?" I said, "Gee, I don't know." There is a pride of lions, a gaggle of geese. I guess ours would be a surplus of Surgeons General. And I think that is accurate, because as each of my predecessors have spoken, I have deleted something from my comments or made other changes, and really there is very little to say.

I would like to submit—I will talk anyway and I have been an academic for almost 40 years. Anyway, I would like to submit my statement for the record to indicate that the Coalition on Smoking Or Health, which is composed of the American Cancer Society, the Heart Association, the American Lung Association, and I collaborated on preparing that and I would like to thank them for sponsoring my trip from San Diego here to testify.

I would like to philosophize a little bit about disease and what has happened through history. The history of our knowledge of disease, if you go back to Hippocrates, is it is provided in its terminal stages. The patient is about to die. As it is studied, the disease is recognized a little earlier. First palliative treatment is offered, then, as treatment becomes more available, treatment can occur during the early phases of disease. And, finally—maybe cured after the disease occurs, but, finally, disease prevention comes into play. And that is what we are talking about here today. This may be the most important piece of legislation in disease prevention in a long, long time.

I am reminded of when I moved into the office that later became Surgeon General, John Knowles had been proposed by President Nixon as an Assistant Secretary for Health. You have to be a certain age, probably 60, to remember some of this. And he was blocked by Senator Dirksen for about 6 months and ultimately Roger Eggerbird came in one dark evening on a Friday, and he was approved shortly thereafter.

But he had trouble. He was dean of the School of Medicine at the University of Southern California and had a lot of trouble, and said, "Jesse, I need a 6-week, 2-month vacation in Hawaii; would you leave the cancer institute and come down here and sit in the office." So there were just piles and piles of paper. Nobody had been in the Office of the Assistant Secretary of Surgeon General for a long time. The biggest pile happened to be fluorides, was the decision the Nixon administration had to make on whether or not to require fluoridation of water supplies in towns of a certain size. I read through the stack and I said, "Absolutely", and believe it or not they agreed with it.

Now, 20 years later, we have a surplus of dentists and we have closed dental schools. And it is not that the dentists are starving, but caries, which was present in about 97 percent of the population, is not a vanishing disease but the mainstay of dentistry has disappeared as a result of one action in the Federal Register. So a single action can have an enormous amount of consequence.

In 1971, I made a speech in introducing a Surgeon General's report. In those days we presented them at the Interagency Council on Smoking and Health and closed by calling for a nonsmokers

bills of rights. This did not endear me with the bureaucracy at HEW, OMB or at the White House. But we got a lot of mail, 5 percent positive, and I thought it might be a good idea to review the data on what was then called passive smoking. I thought the data already were significant.

We already knew that the children of parents who smoked were hospitalized at a much higher rate with pneumonia and other respiratory diseases. We knew about pregnant women who smoked having smaller babies, as Dr. Richmond just described, and we knew from all the animal studies since no animal other than man voluntarily smokes, that involuntary smoking would have to be bad.

I would make a plea for the use of the term involuntary smoking. Nobody really smokes passively. We really have no choice. If we decide not to breathe, we die. So I think the term should be involuntary smoking and would hope that it would be used in the future.

In the prepared statement I made the comment that the Secretaries of HEW under whom I served both smoked as did most of their staff. That was not meant as a criticism; it was meant as a social comment at the time. Everybody smoked. If you watched movies of the 1940's, 1950's and 1960's, smoking was ubiquitous and almost all adults smoked. I would like to compliment President Clinton for banning smoking in the White House.

Smoking, or cigarettes, are the only disease known to man that has an advertising budget that is used highly effectively. I often wonder what some of the other diseases might have been able to accomplish if they had incredible sponsors, such as tobacco smoking has.

I just have a few final comments. One, to second what most of my predecessors have said, it would be highly desirable to have a single agency to regulate the growing manufacture, production, advertising, use and every other aspect of cigarettes and other forms of tobacco. The tobacco industry has had enormous success in dividing and conquering. The Treasury Department wants the taxes, the Trade Representative wants to increase exports, the State Department similarly wants to increase exports. In fact, when I was Surgeon General, the Agriculture Department was working on increasing the yield per acre of tobacco and increasing the amount of tar and nicotine.

I am reminded that right after the report or the warning was changed from "Cigarette smoking may be hazardous to your health", which was the warning from 1966 to 1971, the warning changed to danger—or, actually, it was "Caution: cigarette smoking may be hazardous." It became, "Warning: the Surgeon General has determined that smoking is dangerous to your health", and ads were taken off radio and TV and all print ads, the billboards and all the ads in magazines had to display the warning prominently. And the only thing you could see on the billboard was the side of the pack of cigarettes with the warning. You could make out the brand, Camel's, Lucky Strike, Marlboro, or whatever, and the tar and nicotine level, all of which were mandated.

There were no models. There were no muscular young men in tights, there were no beautiful buxom young women running along the beach. Nothing like this. It was simply like a tombstone ad.

And then—and I am not sure who would regulate it, I guess the FTC, but maybe nobody—the industry and its advertising agencies began slowly to decrease the pack of cigarettes, move it to the side, decrease the size of the warning, put models in. And, now, as I drive along the highways, even with binoculars I have difficulty reading what the warning is because they use a type or a font which is a combination of the Cyrillic alphabet, Hebrew and Chinese, so that it is very difficult to even read the warning.

It is inconceivable to me, after all these years and all the accumulated scientific data regarding the numerous toxic chemicals in tobacco and in tobacco smoke, that the Congress, not only the Congress, but the Congress continues to view these products as neither a food nor a drug. The cigarette is a fiendishly clever method of delivering nicotine, the most addicting compound known to man, efficiently to his lungs and to his brain.

One last personal comment. Again, you would have to be of a certain age, 50 years at least, but 25 years ago I issued a Surgeon General's report on television and violence. It was five volumes of new research on television violence and one summary volume. The committee was formed the same way as the Surgeon General's Committee on Smoking and Health; that is, the membership list was sent out to the networks. They could eliminate anybody who they felt was prejudiced, which caused a great deal of grief with the press and others, but, in any event, the committee finally issued a report in the language of social scientists, which meant it was almost incomprehensible. However, I had attended the meetings and it was clear that they felt that violence on television affected a very small but susceptible part of the population. Now, it does not take but one person to blow up an airplane or to go out with an automatic weapon and kill a lot of people.

So I suggested as a control mechanism that we develop a violence index to be administered by a group, not controlled necessarily by government but certainly not by industry. That was felt to be un-American by the three network heads who were present, and they said they would work out instead a children's time during the evening or the evening hours when children are watching before they go to bed, and that is what was done, and you know how well this has worked. Twenty-five years later, we are back at the beginning and saying what can we do about television violence.

The point is, if we wish to protect the public health from tobacco-induced death and diseases, the kind of legislation you have introduced is imperative because, while it does not mandate Federal expenditures and control, it accomplishes the same thing using citizen participation.

I would like to close by pointing out that not only lung cancer and respiratory disease in children and adults is caused by involuntary smoking but heart disease as well. There is a position paper from the AHA which is described on page 7 of my prepared statement.

And in summary, I would say that the Coalition on Smoking and Health and I strongly support H.R. 3434 and urge the committee to move forward with this bill as quickly as possible. The science is clear, the public supports the banning of smoking in public places, and there is no reason to delay your approval.

The bill will increase our public's health at a cost far less than that of treating innocent victims of smoking, whether voluntary or involuntary. If the bill becomes law, it will accelerate the rate at which smokers quit, because it is the social pressure of the last few decades which has resulted, I believe, in the decrease in the number of smokers.

In the long run, this bill may help smokers to a degree commensurate, maybe greater, than nonsmokers, and that will have to be decided by epidemiologists and statisticians in the years to come.

So we urge your approval for all Americans, smokers and nonsmokers alike, and we thank you for the opportunity to testify.

[Testimony resumes on p. 155.]

[The prepared statement of Mr. Steinfeld follows:]

STATEMENT OF JESSE L. STEINFELD

Mr. Chairman and members of the Subcommittee on Health and the Environment, I am Dr. Jesse L. Steinfeld. I served as Surgeon General of the U.S. Public Health Service from 1969 to 1973. Previously, I served as Deputy Director of the National Cancer Institute and subsequently served as Dean of the Medical College of Virginia. My last position prior to retirement was as President of the Medical College of Georgia. I have participated in the war against tobacco smoking for over 40 years.

Today I am testifying on behalf of the American Cancer Society, the American Heart Association, and the American Lung Association, united as the Coalition on Smoking OR Health. Formed in 1982, the Coalition has worked to heighten public awareness about the impact of tobacco consumption upon public health. The Coalition believes strong measures should be imposed to discourage tobacco use in all segments of the population, including youth, women, and minorities. The Coalition has also pushed for more adequate safeguards for nonsmokers, particularly children, to protect them from the health risks posed by exposure to environmental tobacco smoke.

Also I am testifying today as a former Surgeon General personally and will identify my personal opinions with which the Coalition may or may not agree. I agree with all of the opinions and suggestions of the Coalition.

First, on behalf of the Coalition, I would like to commend Chairman Waxman for his introduction of H.R. 3434, the "Smoke-Free Environment Act," and for his ongoing

commitment to reduce cigarette smoking and exposure to environmental tobacco smoke. I am pleased and honored to appear before this subcommittee on the important issue of protecting nonsmokers from the health hazards of environmental tobacco smoke.

It is important to view the issue of tobacco smoking both with a historical perspective and in the context of our changing society. It would have been improbable, if not impossible, to conceive of the introduction of this bill during my tenure as Surgeon General. The Secretaries of Health, Education, and Welfare under whom I served both smoked, as did many, if not most of their staff. The White House had its own insignia on the little packages of cigarettes freely available to guests. So did Camp David. With some maneuvering, I managed to get a statement published in the Federal Register that all buildings owned, leased or operated by the General Services Administration (GSA) would have nonsmoking conference rooms, cafeterias and similar public places. This was almost fully observed in the breach rather than in practice, even in HEW and its subsidiary health operations, including the National Institutes of Health Conference and Study Section rooms, except when I was present. The time, the social climate, the overall public awareness of the public health significance of cigarette smoke was not ready for the kinds of actions taken over the last 15 years, or the kind proposed today.

Last month, on January 11, the health community commemorated the 30th anniversary of the first Surgeon General's report on smoking and health. I joined with the other men and women who had the privilege of serving as Surgeon General in calling on Members of Congress and the President to take forceful action to protect nonsmokers through prohibitions on smoking in public

places and other measures. For the last 30 years the tobacco industry has successfully resisted efforts by the public health community, Congress, and the courts to implement policy changes that could have saved the lives of literally millions of Americans. Today's hearing focuses on an issue of primary importance, one on which you can and should act expeditiously in order to protect the health of all Americans.

The problems caused by environmental tobacco (ETS), or passive smoking, have been a concern for public health professionals for well over 20 years. This was a very controversial issue when I raised it in 1971. It took a bit of doing to have a chapter included in the 1972 Surgeon General's report on smoking and health. That chapter reviewed the 10 available studies on the health effects of passive smoking. Passive smoking is a misnomer, or perhaps an oxymoron. Involuntary smoking is the proper term, for if we stop breathing, we stop living.

That 1972 report asserted that "an atmosphere contaminated with tobacco smoke can contribute to the discomfort of many individuals," as well as increased respiratory diseases as pneumonia and increased numbers of hospitalization for the children of smokers. Speaking of discomfort, the publishing of that chapter significantly contributed to my discomfort. Not only was I attacked by the ever-present tobacco industry and its hired minions, but by leading physicians and scientists working in the tobacco and health field. Their concern was that I would distract the country from the campaign to get heavy smokers to smoke less and light smokers to quit. My response was that, as physicians and scientists at meetings, we were preaching to the converted and that what was needed was social action, particularly at the local level: even a

single restaurant, a single church, or a single manufacturing plant to restrict smoking. We needed legislation at whatever level, and then we could proceed from there.

The response from the non-smoking American public was overwhelmingly positive. There were thousands of letters and 95 percent were positive. I should add that this resulted from speeches and exhortation on my part, since I believe only a select few Americans read the Surgeon General's reports with much care. And I spent the 15 years after my term ended encouraging epidemiologists, statisticians, physicians and scientists to undertake new and larger studies on ETS in both man and animals. An even larger problem was convincing governmental and non-profit research organizations to fund such obviously ludicrous studies. Social change takes a long time and it is necessary to live a long life if you wish to see the results.

Since 1973, we have amassed evidence to demonstrate that ETS does far more than cause discomfort in adults and respiratory disease in children. In 1982, the Surgeon General looked at passive smoking in the context of the development of lung cancer. At that time there were only three epidemiologic studies linking involuntary smoking and lung cancer. Even with this limited amount of evidence, the Surgeon General concluded that the data in these studies was the cause for serious concern regarding the possible public health problem associated with involuntary smoke and lung cancer.

By 1986, federal interest in the health effects of ETS led the Surgeon General to issue a report solely on the issue of involuntary smoking. By then there were 13 epidemiologic studies, of

which 11 showed a positive correlation between passive smoking and lung cancer in healthy nonsmokers. The Surgeon General at that time concluded that exposure to secondhand smoke is a cause of lung cancer in healthy nonsmokers. He also reaffirmed that children whose parents smoked had an increased frequency of respiratory symptoms and infections, compared to children whose parents were nonsmokers. Another conclusion of the 1986 report, with particular significance for this subcommittee, is that "simple separation of smokers and nonsmokers within the same air space may reduce, but does not eliminate exposure of nonsmokers to environmental tobacco smoke."

That same year, the National Academy of Sciences and the International Agency for Cancer Research published reports which drew conclusions showing the health risks of exposure to ETS.

After these reports were issued, the Environmental Protection Agency began an examination of the health effects of involuntary smoking on children and adults. A draft analysis of the potential correlation between ETS and lung cancer in nonsmoking adults and respiratory disease and pulmonary effects in children was issued in May, 1990. After extensive scientific review, the EPA issued its risk assessment in January, 1993, entitled "Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders." Based on the total weight of evidence in the scientific literature, the EPA designated ETS as a Group A carcinogen, a rating used only for extremely hazardous substances known to cause cancer in humans. Other substances with this rating include asbestos, benzene, ionizing radiation, vinyl chloride and polycyclic hydrocarbons, the etiologic basis of the first known cause of cancer which occurred in children

who were chimney sweeps and reported by Percival Pott in 1775.

Based on its evaluation of 30 epidemiological studies on lung cancer in nonsmoking adults, the EPA determined that ETS is responsible for approximately 3,000 lung cancer deaths each year. The agency also concluded that ETS accounts for the development of 20 percent of all lung cancers caused by factors other than voluntary smoking. My personal belief is that it is over 20 percent.

The EPA also evaluated more than 100 studies on respiratory health in children. The Agency concluded that ETS exposure increases the risk of lower respiratory infections in children, such as bronchitis and pneumonia. According to the EPA, ETS causes an estimated 150,000 to 300,000 cases of respiratory illnesses in children up to 18 months old each year. Of these cases, 7,500 to 15,000 result in hospitalization. Frequent childhood respiratory infections are one of the most important risk factors for the development of chronic lung disease in adults.

The EPA also found that ETS exposure is associated with additional attacks and increased severity of symptoms in children with asthma. It estimates that 200,000 to one million asthmatic children have their condition worsened by ETS, and that ETS is a risk factor for new cases of asthma in children without a history of symptoms. Asthma remains a leading cause of school absenteeism in children.

Involuntary smoking was additionally found to have subtle but significant effects on the

respiratory health of nonsmoking adults, including coughing, phlegm production, chest discomfort, and reduced lung function.

Environmental tobacco smoke is also implicated in cardiovascular disease and death. In 1992, the American Heart Association issued a scientific position paper which concluded that ETS increases the risk of heart disease. The AHA said that the risk of death due to heart disease is increased by about 30 percent among those exposed to ETS at home and could be much higher in those exposed at the workplace. The report also found that an estimated 35,000-40,000 cardiovascular disease-related deaths due to ETS exposure are predicted each year.

The evidence presented in the EPA risk assessment represents sound science and provides abundant and strong support for the conclusions regarding exposure to ETS. Each of the studies and reports used by the EPA were developed and edited by different processes. This diverse methodology strengthens the validity of the conclusions based on the weight of the evidence. The EPA's findings are clear, objective, and complete in regard to ETS. The evidence used to show the relative risks associated with exposure to ETS, and its linkage to the development of lung cancer, are more compelling than similar correlations drawn for other environmental carcinogens.

The EPA has done its job properly by analyzing the risk posed by exposure to ETS. The time has come for policymakers to respond to the public health issue associated with exposure to ETS, particularly in those places where children and adults spend significant time. The bill you

have introduced, H.R. 3434, the "Smoke-Free Environment Act," is a very important step in the process of providing a policy based on EPA's scientific findings. This bill provides a simple, yet sweeping response to the EPA risk assessment.

The "Smoke-Free Environment Act" will provide protection from the health hazards of ETS for millions of Americans. Under this legislation, smoking will be banned in all public facilities, except in areas that are separately ventilated. Any building used by at least ten people at least one day a week will be covered by this bill. Residences are not included. The Environmental Protection Agency will be charged with issuing the regulations to carry out the requirements of the bill. This bill will guarantee all public facilities will have cleaner air, free of tobacco smoke. Nonsmokers, particularly children, will have access to public places that are healthier.

Many private organizations and companies, as well as state and local governments, have responded to the EPA risk assessment by limiting or eliminating smoking in their facilities. While well meaning, these efforts have provided inconsistent protections. The protection for nonsmokers is extensive in some regions and quite minimal in others. H.R. 3434 offers a more comprehensive policy to afford the public the greatest protection from the health hazard created by ETS.

I urge this subcommittee to take into consideration growing interest in smoke-free public places, which has gained momentum since the release of the EPA risk assessment. Based on a public opinion survey conducted by the American Lung Association, it is clear that more and more

Americans believe ETS is harmful, and that they prefer smoke-free public places, as opposed to those environments in which smoking is permitted.

In this survey, the Lung Association found that 8 in 10 smokers know that ETS is bad for the people around them. We also found that nonsmokers are more likely than smokers to strongly agree about the harmful effects of ETS exposure. The survey found increasing support for total bans on smoking in public places such as restaurants, workplaces, hotels, buses and trains. And though current smokers are more likely than others to believe that smoking in public places should be restricted, very few smokers surveyed favored no restrictions.

Clearly, as the awareness of the health hazards of ETS increases, more Americans are striving to live, work, and breathe in smoke-free environments. Very few of us make it through each day without exposure to ETS. The "Smoke-Free Environment Act" will make the dream of a smoke-free day for the American public come much closer to reality.

Further, Mr. Chairman and members of the subcommittee, I want to point out that it seems inconceivable to us that with all of the scientific evidence now implicating ETS as a cause of disease in nonsmokers that you have not acted to require that cigarette packages and advertisements carry warning labels and other information about the dangerous effects of ETS. This is in part due to the fact that no regulatory agency has any authority to ensure that the public is protected and properly warned about the dangers of cigarette smoking. The Coalition urges this subcommittee to act on legislation to ensure that tobacco products are properly

regulated in the manner in which they are manufactured, sold, labeled, advertised and promoted. Legislation introduced by the Chairman and by Congressman Synar to give the Department of Health and Human Services and the Food and Drug Administration the full authority they need to protect the health of the public from the ravages caused by this addictive killer has the full support of the Coalition.

The Coalition on Smoking OR Health and I strongly support H.R. 3434 and urge the subcommittee to move forward with this bill as quickly as possible. The science is clear. The public supports smokefree public places. There is no reason to delay. Your approval of this bill will increase our public's health at a cost far less than that of treating the innocent victims of smoking, whether voluntary or involuntary. For, if this bill becomes law, it will accelerate the rate at which smokers quit, as the social pressure of the last few decades increases considerably. In the long run, this bill will help smokers to a degree commensurate with nonsmokers, but the relative benefits will have to be decided by epidemiologists and statisticians in the years to come. We urge your approval of this bill for all Americans, smokers and nonsmokers alike.

Mr. WAXMAN. Thank you very much, Dr. Steinfeld, for an excellent presentation.

I want to commend each of you for coming to the committee and for speaking out on this issue. It has been 30 years since the first Surgeon General report warned us that smoking tobacco is dangerous to our health, and now, over this 30-year period, we have seen Americans give up smoking, but now there is this new danger which has been documented over the last decade or so about those who smoke involuntarily.

We are asking the Congress to take action by requiring that in places that the public goes into, in public buildings, that there be a smoke-free environment. H.R. 3434 is a relatively short bill. There is no government bureaucracy created. There is no government expenditures that would be required, except for the government to put up signs in government buildings that smoking would not be permitted. And, yet, I want to know if any of you can think of any other public health intervention with the potential to achieve such a profound and positive impact on preventable death and illness.

It seems to me this legislation saves so many lives, prevents so much misery, saves so much money and can do all of this at so little a cost that it should not be left behind in our health care efforts.

Just so we can have it for the record, I would like each of you to respond whether you would endorse H.R. 3434.

Dr. Elders.

Ms. ELDERS. Chairman Waxman, I think, for the administration, that we do endorse H.R. 3434. And I feel that, as you say, that prevention has to always be a major initiative; that we want to improve the health of America. And we know that of all our diseases that are caused, that 50 percent of all the diseases that are preventable, all the causes of death are preventable, and tobacco leads that list. So I support 3434.

Mr. WAXMAN. Thank you very much.

Dr. Novello.

Ms. NOVELLO. For the longest time we have said that we have to speak for those who cannot communicate for themselves, in this case the children. So anything that protects their life is good science and is good common sense. So I would absolutely support it.

Mr. WAXMAN. Thank you very much.

Dr. Steinfeld.

Mr. STEINFELD. One hundred percent support not only for the children, with whom I agree, but for all Americans.

Mr. WAXMAN. Dr. Richmond.

Mr. RICHMOND. Well, Mr. Chairman, I, too, in my formal testimony and now would reinforce my support for this legislation. I think that your comment that this is probably the single piece of legislation which would advance the public health more than any pending legislation, I think is an accurate one and I think we should all be mindful of.

I think this is a long-term educational venture that we have embarked upon and the implementation of the actions that could come with the passage of this legislation would engage the American

public in that kind of educational effort to protect their children's health as well as their own health.

Mr. WAXMAN. Thank you.

Dr. Ehrlich.

Mr. EHRLICH. Mr. Chairman, seconding Dr. Richmond's statement about the important public health effects of this legislation, I can support it without reservation.

Mr. WAXMAN. Thank you.

I recently received a letter and I wanted to read a portion of it, because it is really puts things, I think, in somewhat of a clear perspective. This letter came from the Texas Medical Association, and I would like to ask unanimous consent to place it in the record. Without objection, that would be the order.

I am going to quote. "In the early part of the century, before cigarettes were in great use, men used more chewing tobacco; thus, there were spittoons in restaurants, bars and buildings so they could spit out the excess saliva. When it was discovered that tuberculosis was spread through spitting, numerous laws were passed eliminating spitting inside buildings and even on sidewalks outside.

"Most of us alive today have never seen the spittoon in a restaurant or a bar. Most Americans would never think of spitting in a restaurant. Fifty years from now, it will be as disgusting to think that people actually smoked in restaurants or buildings."

I think that is an interesting historical parallel, and I thought it would be wise to put that in the record so that people could think about what we are talking about today. It is not extreme, it is not radical to try to save children from being forced to involuntarily smoke or to save others who are adults from all the medical problems that come from involuntary smoke. And there will come a time when we will look back at this legislation as something that was just plain common sense and everyone will wonder what the fuss was all about, why the tobacco industry tried to, at every turn, to stop it.

Thank you.

[The letter referred to follows:]



JAN 26 1994

January 18, 1994

The Honorable Henry Waxman
House of Representatives
2408 Rayburn House Office Building
Washington, D.C. 20515

RE: Smokefree Environment Act of 1993 (H.R. 3434)

Dear Representative Waxman:

This letter is in full support of H.R. 3434, "Smokefree Environment Act of 1993". We need to protect the majority of Americans who do not smoke from the deadly effects of environmental tobacco smoke (ETS). This can only be done by restricting smoking in all public places; there is no safe level of the dozens of carcinogens and toxic chemicals that are found in tobacco smoke.

Before we outline the toxic hazards of secondhand smoke, please consider the common sense facts. Smoke stinks and is irritating to 70 to 80% of the population. We put chimneys on fireplaces, hoods in laboratories, vents in bathrooms and kitchens and barbecue outside. Most cities in this country do not let citizens burn leaves in their backyard, but allow the burning of leaves in almost any building as long as they are wrapped in a little white piece of paper. The tobacco industry proposes the considerate smoker theory where it is all good and well and non-smokers should just ask smokers not to smoke around them and smokers should ask if they can smoke around others. A study showed almost 50% of smokers never ask if they can light up and only 7% of non-smokers will ask a smoker not to smoke. This does not even include children who are almost powerless to ask smokers to stop smoking.

Tobacco use and exposure to tobacco smoke remains the single most important preventable cause of death in our society. Each year, 418,000 Americans die from smoking related diseases and exposure to ETS is the third major US killer, behind deaths from active smoking and alcohol. Exposure to ETS produces an increased risk of development of acute lower respiratory infections, middle ear effusions, asthma and respiratory irritation in children exposed to tobacco smoke, and is a risk factor for Sudden Infant Death Syndrome. ETS has also been implicated in between 35,000 and 40,000 premature deaths from cardiovascular disease and another 3,000 deaths from cancer each year. The US Surgeon General and the Environmental Protection Agency have concluded that ETS is a class A carcinogen that causes fatal and debilitating diseases in non smokers and the National Institute for Occupational Safety and Health has recommended that ETS be regarded as an occupational carcinogen.

The Honorable Henry Waxman

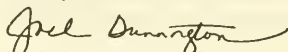
January 18, 1994

Page 2

This issue is not a smokers rights issue, but a public health issue. We regulate numerous public health hazards across the U.S. In the early part of the century, before cigarettes were in great use, men used more chewing tobacco. Thus there were spittoons in restaurants, bars and buildings so they could spit out the excess saliva. When it was discovered that tuberculosis was spread through spitting, numerous laws were passed eliminating spitting inside buildings and even on sidewalks outside. Most of us alive today have never seen a spittoon in a restaurant or bar. Most Americans would never think of spitting in a restaurant. Fifty years from now it will be as disgusting to think that people actually smoked in restaurants or buildings.

The Texas Medical Association is a voluntary membership organization of over 31,000 physicians, representing 83% of all practicing physicians and 96% of all medical students.

Sincerely,



Joel S. Dunnington, MD

Chairman

Tobacco Use Prevention Task Force



Environmental Tobacco Smoke

Overall Tobacco Hazard

- Tobacco is directly responsible for 434,000 deaths each year in the United States and in 1990, 24,600 Texans died from tobacco-related diseases. (Centers for Disease Control and Prevention and the TDH Office of Smoking and Health)
- In Texas, 1 out of every 5 deaths is attributed to tobacco. (TDH Office of Smoking and Health)

Hazards Specific to Secondhand Smoke

- The US Surgeon General and Environmental Protection Agency have concluded that environmental tobacco smoke can cause fatal and debilitating diseases in nonsmokers. In fact, exposure to tobacco smoke is the third major US killer, behind deaths from active smoking and alcohol. (Action on Smoking and Health)
- Waiters and bartenders breathe up to six times more secondhand tobacco smoke than office employees and are 1½ times as likely to develop lung cancer than the general public. Restaurant workers breathe lingering tobacco smoke for long periods of time. Secondhand smoke levels in restaurants were 1.6 to 2 times higher than in offices, and 1.5 times higher than in homes with at least one smoker. (CDC, Office of Smoking and Health)
- Environmental tobacco smoke is classified as a Group A carcinogen. This is the same classification already given to asbestos, arsenic, benzene and other substances known to cause cancer in humans. (EPA report "The Respiratory Health Effects of Passive Smoking")
- The National Institute for Occupational Safety and Health (NIOSH) has recommended that environmental tobacco smoke be regarded as an occupational carcinogen.
- Exposure to environmental tobacco smoke is causally associated with an increased risk of lower respiratory tract infections such as bronchitis and pneumonia in children. It is estimated that there are 150,000 to 300,000 cases annually in infants and young children up to 18 months of age that are attributable to secondhand smoke. (Environmental Protection Agency)

- ETS exposure is causally associated with additional episodes and increased severity of symptoms in children with asthma. It is estimated that 200,000 to 1,000,000 asthmatic children have their condition worsened by exposure to ETS. ETS exposure is a risk factor for new cases of asthma in children who have not previously displayed symptoms.

Responsibility to Children

- Tobacco is a health issue, not a "rights" issue.
- A number of laws have been passed over the years in order to protect the public's health and safety.
- We need to protect the majority of Americans who do not smoke (including children) from the deadly effects of ETS. This can only be done by restricting smoking in all public places; there is no safe lower level for the dozens of dangerous chemicals in tobacco smoke which drift and are recirculated and cannot be filtered out or otherwise eliminated by even the finest ventilation systems. (Action on Smoking and Health)
- Strong efforts need to be undertaken to protect children from tobacco including passive or secondhand smoke. Also need to discourage children from seeing tobacco use as okay.
- Tobacco is a "gateway drug" leading to other drug and alcohol use. Teens age 13 to 17 who are current smokers are 10 times more likely to be actively using marijuana as those who do not smoke and 14 times as likely at be using cocaine, hallucinogens, or heroin. (TMA position paper on Adolescent Substance Use, 1993)

Nonsmoking Policy Not Harmful to Business

- More than 90% of Americans favor restricting or banning smoking in public places. (CDC)
- According to a 1993 Texas poll conducted by Texas A&M University Public Policy Resources Laboratory, 70% of Texans favor a ban on smoking in public restaurants.
- A recent American Cancer Society survey indicates that 73% of Texans ask to be seated in a nonsmoking section.
- A 1993 study by Stanton Glantz, PhD, and Lisa Smith, BA, entitled "The Effect of Ordinances Requiring Smoke Free Restaurants on Restaurant

Sales in the United States: An Update," prepared a multi-state (Colorado and California) comprehensive analysis that examines taxable sales data to determine the impact of smoke free restaurant ordinances on restaurant sales. The numbers reflect all restaurant sales in the community and were collected through consistent methods using sales tax data. Based on restaurant sales data obtained from the California State Board of Equalization and the Colorado State Board of Revenue, there is no evidence that 100% smoke free ordinances have any effect on sales. Public health officials can enact such health and safety requirements to protect patrons and employees in restaurants from secondhand smoke without the fear of adverse economic consequences.

Recommendation for Smoking Ban

- Need to ban smoking in places frequented by children -- e.g., fast-food restaurants.
- Ban also needed to protect the children who work there (40% are under 18).
- The classification of ETS as a known human carcinogen could strengthen the case of employees who have been harmed by ETS in the workplace, resulting in a greater risk for liability of employers who do not protect workers.
- Other states have suggested more aggressive approaches than a ban such as filing lawsuits under the deceptive trade and consumer fraud provisions.
- Federal momentum is building to encourage restriction of minors access to tobacco -- e.g., new rules are in the drafting stage to reduce block grants for substance use prevention and treatment programs in states which do not have or enforce laws to protect minors.
- National Institute for Occupational Safety and Health considers ETS to be a potential occupational carcinogen and recommends that exposure be reduced to the lowest feasible concentration. All preventive measures should be used to minimize occupational exposure to ETS. Workers should not be involuntarily exposed to tobacco smoke.

TMA Tobacco Policies

- Smoking, including passive smoke, poses a public health hazard. The Texas Medical Association supports regulations banning smoking on domestic airplanes, encourages legislation to prevent smoking in public places, and

endorses the allocation of part of the cigarette tax for support of local anti-smoking programs. (November 1988)

- The Texas Medical Association supports the classification of tobacco smoke as a Class A carcinogen and supports its stringent regulation with other Class A carcinogens regulated by OSHA and the EPA. The Texas Medical Association supports the inclusion of all tobacco products under the regulation and jurisdiction of the Food and Drug Administration. (May 1991)
- The Texas Medical Association supports the complete ban of sales of cigarettes from vending machines, bans on the distribution of free samples of cigarettes, including direct distribution through the mail, and the licensing of tobacco vendors with appropriate penalties and revocation of license for selling tobacco to minors. (May 1991)
- The Texas Medical Association encourages physicians to educate parents and guardians about the likelihood of increased chronic respiratory illnesses in children who are exposed to environmental tobacco smoke, especially in closed areas.

Prepared by Texas Medical Association Division of Public Health and Scientific Affairs.

Mr. WAXMAN. Mr. Bliley.

Mr. BLILEY. Thank you, Mr. Chairman.

Dr. Elders, you said in your written testimony on page 2 that secondhand smoke has toxic and carcinogenic effects that are very similar to mainstream smoke. I am not sure I know of anyone who has suggested that secondhand smoke is the same or has the same potential health effects as mainstream smoke. Would you provide documentation for the record for your statement?

Ms. ELDERS. Yes, sir. We will submit that.

[The information follows:]

The statement that sidestream (or "secondhand") smoke has toxic and carcinogenic effects that are similar to those of mainstream smoke is based on an analysis of the toxic and carcinogenic constituents of sidestream smoke, and determination of the ratio of concentrations of these constituents in sidestream relative to mainstream smoke.

The 1988 Surgeon General's report summarizes the toxic and carcinogenic constituents present in sidestream smoke (see attached table). Most of these constituents are present in *concentrations that are far higher than in mainstream smoke* (emphasis added). For several carcinogens (formaldehyde, N-nitrosodimethylamine, N-nitrosopyrrolidine, 2-naphthylamine, 4-aminobiphenyl, benzo(a)pyrene, NNK, and nickel), the concentrations in sidestream smoke may be as much as 20 or more times higher in sidestream smoke than in mainstream smoke. This is the basis of the statement that sidestream smoke has toxic and carcinogenic effects that are similar to those of mainstream smoke.

TABLE 8.—Some toxic and tumorigenic agents in undiluted cigarette sidestream smoke

Compound	Type of toxicity	Amount in sidestream smoke (per cigarette)	Amount in sidestream smoke/amount in mainstream smoke
Vapor phase			
Carbon monoxide	T	26.8–61 mg	2.5–14.9
Carbonyl sulfide	T	2–3 µg	0.03–0.13
Benzene	C	400–400 µg	8–10
Formaldehyde	C	1,500 µg	50
3-Vinylpyridine	SC	300–450 µg	24–34
Hydrogen cyanide	T	14–110 µg	0.06–0.4
Hydrazine	C	90 ng	3
Nitrogen oxides (NO _x)	T	500–2,000 µg	3.7–12.8
N-Nitrosodimethylamine	C	200–1,040 ng	20–130
N-Nitrosopyrrolidine	C	30–390 ng	6–120
Particulate phase			
Tar	C	14–30 mg	1.1–15.7
Nicotine	T	2.1–46 mg	1.3–21
Phenol	TP	70–250 µg	1.3–3.0
Catechol	CoC	58–290 µg	0.67–12.8
o-Toluidine	C	3 µg	18.7
2-Naphtylamine	C	70 ng	39
4-Aminobiphenyl	C	140 ng	31
Benz(a)anthracene	C	40–200 ng	2–4
Benzo(a)pyrene	C	40–70 ng	2.5–20
Quinoline	C	15–20 µg	8–11
NNN	C	0.15–1.7 µg	0.5–5.0
NNK	C	0.2–1.4 µg	1.0–22
N-Nitrosodiethanolamine	C	43 ng	1.2
Cadmium	C	0.72 µg	7.2
Nickel	C	0.2–2.5 µg	13–30
Polonium-210	C	0.5–1.6 pCi	1.06–3.7

NOTE: C, carcinogenic; CoC, cocarcinogenic; SC, suspected carcinogen; T, toxic; TP, tumor promoter; NNN, N'-Nitrosomonilcotine; NNK, 4-(methylnitrosamino)-(3-pyridyl)-1-butanone.

SOURCE: Hoffmann and Hecht (1989).

Mr. BLILEY. OK. Dr. Elders again—in 1992, an expert panel looking into the quality of science at EPA found that many persons, both within and without the agency, perceived the agency's scientific assessment as biased, and that this perception was reinforced by the fact that the same agency that was evaluating the science had a regulatory mission. The report was titled "Safeguarding the Future of Credible Science, Credible Decisions."

Some Members of Congress in both parties also feel that EPA tends to skew the science to support its regulatory and social goals.

Isn't it a serious problem when an independent panel finds that EPA's scientific studies are not objective?

Ms. ELDERS. Mr. Bliley, I think we all want to make the best decisions we can based on the best scientific data that is available, and I feel that if there is scientific data out there that absolutely disputes that, we should look at all the available scientific evidence.

Mr. BLILEY. Thank you.

Dr. Elders, you suggested at the end of your testimony that you had some specific concerns with H.R. 3434. What are they?

Ms. ELDERS. Well, I think the specific concerns—I think as the bill goes along, that there may be concerns in enforcing some of the regulations and we want to make sure that we are aware and that we can make sure that we do all the things that this proposal wants done, as you would like it done.

Mr. BLILEY. Fine.

And one last question. I understand your support for the Waxman bill, but let me ask you this. In the interest of good science, would you encourage EPA to review and revise its risk assessment on ETS as necessary when new and sufficient information becomes available?

Ms. ELDERS. Mr. Bliley, certainly we all want the best scientific data that we can get to make a decision. And I am sure that if EPA gets a lot of creditable science to suggest that they need to rethink their decision, I feel they will do that.

Mr. BLILEY. Thank you very much.

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Bliley.

Mr. Wyden.

Mr. WYDEN. Quick question. Do each of you believe there is an overwhelming preponderance of scientific evidence that favors this legislation?

Ms. ELDERS. Yes.

Ms. NOVELLO. Yes.

Mr. STEINFELD. Absolutely.

Mr. RICHMOND. I would say, as I did in my testimony, that in 1979 we needed more data, and I said that. And since that time and in the ensuing 15 years, the data are very abundant.

Mr. EHRLICH. I would agree.

Mr. STEINFELD. Could I add, Mr. Wyden, that since the Surgeon General's report on involuntary smoking, I think the amount of papers and the amount of data has doubled. So that would be between 1985 and 1993.

Mr. WYDEN. Let me ask the four previous Surgeons General a question, in counsel for Dr. Elders. It seems to me that the tobacco

industry has engaged in an extraordinary campaign of misinformation about the dangers of smoking. This has gone on for years and years and years. You four at this end of the table I think have seen it in your previous tenure.

I wonder what advice you would have for Dr. Elders as she tries to take on the tobacco industry, win this fight for the kids and all the rest of America.

Dr. Novello.

Ms. NOVELLO. I think that the teaching might not only be for Dr. Elders but for the committee and the American public as well. I have the feeling that as long as beautiful data, scientifically minded as the one we are discussing today, only stays within the counters of this big room, we are also missing out to get the American public informed. Because public opinion is a wonderful tool, but if you do not know we are watching for your health, you will become angry at taking away your rights, when I believe the first thing is we are anti-tobacco, but we are not anti-smokers.

So in that sense it seems to me that the first thing I would say is credibility, facts at your fingertips, and make sure you talk about them on a constant basis, but more importantly, we have to move away a little bit from the lung cancer and let the American public know of all the other consequences that come with smoking, which so many times we don't talk about.

In that sense, many times we share some of the same talks when we say, tobacco is tobacco, whether you smoke it, spit it or chew it. And that is why the American public has to be aware of this. Credibility, facts, and most importantly, constant going on in spite of the pressures from the outside.

Mr. WYDEN. Dr. Elders is writing very fast.

Ms. ELDERS. I am listening.

Mr. STEINFELD. I am not big on giving advice at this point. I would say do what is right. You clearly are doing what is right. Just continue it.

Mr. RICHMOND. I think that history has shown that the truth is very eloquent. When I was Surgeon General, the tobacco industry was spending then \$2 billion versus \$10 million that we had for our educational effort. And yet, the numbers of smokers, the percentage of people smoking in our country has come steadily down.

So I would say just stay with the science, engage in consciousness raising for the American public, and that the truth is very eloquent.

Mr. EHRLICH. I would certainly agree with everything my colleagues have said. I would only ask that one other thing be emphasized, and that is that we do seem to have the public support for these actions, the actions that are in this proposed bill and other actions, to limit smoking. And I think that the Surgeon General should exploit the fact that there is public support for these actions.

Mr. STEINFELD. Again, may I add something?

I think we shouldn't put the entire load of the 400,000 deaths and other diseases associated with smoking on the shoulders of the Surgeon General. The Surgeon General can do a lot with the bully pulpit, but this committee can do a lot, and probably can do a great

deal more, because it is the social pressure that causes people to quit.

If one is in a car and one is a smoker and the others are not, the pressures are enormous. More people have quit smoking not because they have been educated but because of social pressures. So passage of this bill would increase the social pressure enormously.

Mr. WYDEN. Dr. Elders, the Tobacco Institute is going to say that this legislation is, quote, "an example of social engineering on a vast scale", and they raise the prospect that this is going to do great damage to the True Value hardware store and a variety of other businesses across this country.

What I find very odd is that our government has all kinds of policies that ensure it is going to be possible for citizens to travel safely to the True Value hardware store. We have stop signs, red lights, a variety of policies to make sure you can make it to the True Value store, but it seems to me we also have a very significant societal interest in making sure that those kids are protected when they are inside the True Value store from a class A carcinogen. Do you agree with that?

Ms. ELDERS. I certainly agree. We have more regulations protecting the Teddy bears than we have regulating tobacco, and I think that is a real problem.

Mr. WYDEN. Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you.

Mr. Synar?

Mr. SYNAR. No questions.

Mr. WAXMAN. Mr. Kreidler?

Mr. KREIDLER. Thank you, Mr. Chairman.

Perhaps, Dr. Steinfeld, you would be willing to take this question. There was a recent study, I believe a longitudinal study, very comprehensive, and I believe it has been somewhat misinterpreted as to the effects of smoking cessation—at least I think superficially it could be interpreted that way in the media—that the results were that when you quit, you don't have any regression of the harmful effects of smoking, that you build up some cellular damage that is going to remain with you the rest of your life and increase your potential for, let's say, lung cancer.

There is also the indication, I think it is very important to point out, and correct me if I am wrong, obviously your possibilities of developing cancer continue to increase the longer you go on smoking without quitting.

Do you have any comments on that particular study, since it has been widely covered in the media here recently?

Mr. STEINFELD. I can't comment on one particular study, because there have been so many studies on quitting.

First of all, people, many people who quit and die shortly thereafter have had lung cancer. Lung cancer, unlike most infectious disease, does not appear quickly. Most individuals who have lung cancer probably have had it for a period of 5 years. It takes 30 doublings of a single cancer cell to reach the size of the tip of your little finger, which is probably the limit at which it can be diagnosed, even with our most recent diagnostic techniques.

So lung cancer has been present 3 to 5 years, probably, at a minimum. If somebody quit smoking, that isn't going to make that lung

cancer go away. What happens, though, in a person who quits smoking, is that after a few years, that is, after the cancers that have already been present have developed, then their incidence of lung cancer begins falling off, until at about 15 years it is still twice that of the nonsmoker.

However, remember, there are no nonsmokers in our society. We are all involuntary smokers. So I think the figure ultimately of cancer caused by smoking, involuntary smoking, will be higher than what it was.

So I would not buy that particular study. I think there are too many.

Now, there are several other things that happen when a person quits smoking. They do begin eating more, because they can taste things. Many of them find that they haven't tasted food for a long time. So there is that pleasure. They stop producing the amount of mucus that they did. The cilia that bring the mucus up, that they cough up every morning, is no longer paralyzed, and after a while their pulmonary function improves.

The clotting ability, the tendency to increase clotting that occurs with smoking, with nicotine, carbon monoxide, decreases. And the carboxyhemoglobin, which carbon monoxide has 210 times affinity for hemoglobin that oxygen does, so their hemoglobin level may go down a little bit, but their exercise tolerance increases, and their incidence of heart attacks begins decreasing, but at about 2 years it probably reaches as much as it is going to. So they have improved taste, improved lung function, improved feeling, improved exercise ability, and a decrease in the likelihood of heart attacks and lung cancer.

Now, a single study, I think one can find fault with. I have not read and studied that one. But there are hundreds showing the opposite.

Mr. KREIDLER. I appreciate that. This was just a recent study that appeared I think in the last week that was widely covered. It was the most comprehensive longitudinal study I think that had ever been done on the effects of smoking. That is what I was referring to. It was covered at least in the popular media.

Ms. NOVELLO. I just wanted to make a point on that. The 1991 Surgeon General's report was called "It Is Never Too Late to Quit." And the research in that one did show very, very, very well that when you do stop smoking before the age of 50, chances of extending your life to at least 7 more years is a reality. However, it depends on how much you smoke, the duration of what you smoke, and what you smoke. So the reality shows it is never too late to quit.

Mr. KREIDLER. If I might just follow on this very quickly, one issue that came up with that, there was a Health and Human Services recommendation at the end of President Bush's administration to end smoking in all Federal buildings. That did not take place. That order was never issued. What was the reason why that never happened?

Ms. NOVELLO. One of the things that I can tell you that it was suggested that that would be across all working spaces, the Department of Health and Human Services did it in the Humphrey building. We worked on Naval, to do it in every building where there

were government workers, because there were other departments present and there was no coalition. However, there were so many things at the end of the administration, that I think this was one that had to be left for the other administration.

Mr. KREIDLER. Thank you.

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Kreidler.

Well, it is obvious to me that six Presidents chose very distinguished Surgeons General to serve them, their administration, and the American people. You have traveled, some of you, a long way with a great deal of difficulty. I want to thank you very much for being here.

This is one of the most impressive panels of witnesses that I have ever seen together in one place in the years that I have been in the Congress. Your commitment and dedication to public health is unparalleled. And we thank you very much for your heartfelt and clear-headed statement to us that we have got to do more to reduce the threat from tobacco smoke, especially to those who are smoking involuntarily.

Thank you for being with us.

Mr. RICHMOND. Thank you, Mr. Chairman.

[The following letter was submitted:]

PAST SURGEONS GENERAL OF THE UNITED STATES

March 21, 1994

The Honorable Henry A. Waxman
U.S. House of Representatives
Washington, D.C. 20515

Dear Representative Waxman:

We are the former Surgeons General for the past 25 years. Last month, we testified before the Subcommittee on Health and the Environment in strong support of H.R. 3434, the Smoke-Free Environment Act. We are writing now to reiterate the vital importance of H.R. 3434.

H.R. 3434 is the most important legislation in disease prevention in years. According to the Environmental Protection Agency, enactment of H.R. 3434 would save 38,000 to 108,000 lives each year. It would also avoid countless incidents of respiratory illness and asthma attacks in children. This is an enormous savings in human life and illness -- and under H.R. 3434, it would be achieved at minimal cost and with minimal bureaucratic involvement.

An overwhelming body of scientific evidence proves that environmental tobacco smoke (ETS) poses a significant health risk for adults, children, and even the unborn. Many studies have shown that ETS is deadly. In fact, ETS is estimated to kill over 50,000 Americans each year, making ETS the third leading cause of premature death in the United States.

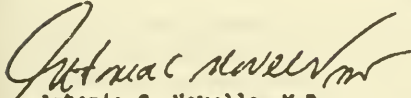
Because of their inability to avoid exposure and their special sensitivities, ETS is a particular risk to children, each year triggering hundreds of thousands of cases of bronchitis, pneumonia, and other respiratory diseases. As many as a million children suffer asthma attacks after exposure to ETS.

Passage of H.R. 3434 would benefit all Americans. The health of nonsmokers, especially children, would improve. Smokers would find it easier to quit. Many teenagers would never take up smoking if there is no place to light up. And businesses would reduce their cleaning costs.

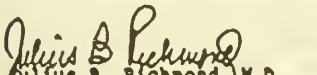
Page 2
March 21, 1994

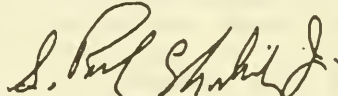
Because of the critical role this bill would have in preventing disease, reducing health care costs, and strengthening our economy, we ask that you support H.R. 3434.

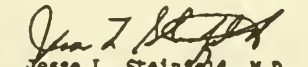
Sincerely,


Antonia C. Novello, M.D.
Surgeon General (1990-1993)


C. Everett Koop, M.D.
Surgeon General (1981-1989)


Julius B. Richmond, M.D.
Surgeon General (1977-1981)


S. Paul Ehrlich, Jr., M.D.
Surgeon General (1973-1977)


Jesse L. Steinfeld, M.D.
Surgeon General (1969-1973)

Mr. WAXMAN. I would like to now call forward the Honorable Charles O. Whitley, a senior consultant to the Tobacco Institute, who will be accompanied by Dr. Larry Holcomb, an environmental toxicologist.

Mr. Whitley, Dr. Holcomb, we want to welcome you to the hearing today. Your prepared statements will be in the record in full. We would like to recognize you for your oral presentation.

STATEMENT OF CHARLES O. WHITLEY, SENIOR CONSULTANT, TOBACCO INSTITUTE, ACCOMPANIED BY LARRY HOLCOMB, ENVIRONMENTAL TOXICOLOGIST

Mr. WHITLEY. Thank you, Mr. Chairman. We appreciate this opportunity to appear before you today on behalf of the Tobacco Institute to discuss the proposed Federal smoking ban in public buildings, H.R. 3434, which you and others have introduced.

This bill would amend the Public Service Act by adding a title that will require smoking to be banned in every building in the United States as regularly entered by 10 or more people at least 1 day a week. Smoking would be prohibited not only inside the building, but also on facility property, quote, "within the immediate vicinity of the entrance", unquote. This bill would exempt only buildings or portions of buildings regularly used for residential purposes.

Smoking within a building could be allowed outside only in areas ventilated in accordance with specifications established by EPA to ensure that air from the smoking area, quote, "is directly exhausted to the outside and does not recirculate or drift to non-smoking areas."

A smoking area, moreover, would have to be one that non-smokers do not have to enter for any purpose. EPA would be empowered to issue regulations to carry out the act.

Under the bill, the responsibility for implementing the smoking ban would rest with the person who owns or leases the building. The bill would allow private parties, as well as governmental entities, to bring actions against building owners to enforce the requirements of the law.

This is, Mr. Chairman, one of many Federal, State and local responses to EPA's report classifying environmental tobacco smoke as a group A carcinogen. I do not propose to discuss in detail the scientific deficiencies in the claim that exposure to environmental tobacco smoke poses health risks. I will leave that to Dr. Holcomb. I can say, however, that EPA's report is scientifically flawed and does not support the extreme measures found in H.R. 3434.

Mr. Chairman, I would like to mention a curious irony at the outset. And that is, here we have a bill that in essence bans smoking—and you are right, Mr. Wyden, in factories, office buildings and the local True Value hardware, the 7-Eleven, and almost all other workplaces; in restaurants, nightclubs, taverns, malls, bowling alleys, pool rooms and bingo halls; in union halls, VFW posts, and Knights of Columbus halls; in bus depots, train stations and airports; and in hotels, motels—but the EPA risk assessment did not consider exposure data from those places in reaching its conclusions about the health risks supposedly associated with exposure to environmental tobacco smoke. Instead, it based its conclusions on

studies of reported nonsmoker exposure in the home. Yet, ironically, residences are the only places exempted from H.R. 3434's smoking ban. This logic is difficult to accept.

But it is clear that logic is not the basis for the bill. In reality, this bill is an example of social engineering on a scale that intervenes in the private lives and choices of a quarter of our adult population, and it recalls—I don't want to equate this to the use of tobacco and alcohol, I don't want to get into that argument—but it recalls the extremism of Prohibition, the total ban on the possession and use of alcohol, the last national crusade against a supposed social evil, which was later repealed as being unrealistic.

One might suppose, just looking at this bill, Mr. Chairman, that nothing is now being done to regulate smoking in public places and places of employment throughout the Nation. But State and local governments have enacted numerous laws banning or severely restricting smoking in places of employment and various public settings. Many businesses have voluntarily banned and restricted smoking in places of employment, and restaurants and other facilities open to the public have adopted smoking bans and restrictions as well.

Congress, of course, has banned smoking on domestic flights. This is enforced by the Department of Transportation. It has required WIC programs to ban smoking as a condition of receiving continued Federal aid.

Meanwhile, smoking in most Federal buildings is severely restricted under regulations issued by GSA. The Department of Defense and other Federal agencies have established additional controls. The Postal Service has banned smoking in its facilities. Amtrak has severely limited smoking on trains. The House of Representatives recently adopted rules restricting smoking in its buildings. Thus, there is simply no regulatory void for H.R. 3434 to fill.

Federal OSHA, the Occupational Safety and Health Administration, is the agency with statutory authority to regulate workplace smoking and indoor air quality. And that agency has issued a request for information on indoor air quality issues, including issues related to environmental tobacco smoke, and has received hundreds of comments and has commissioned studies regarding the alleged health effects of exposure to ETS in the workplace. It is studying that matter and has stated it will determine the appropriate regulatory response within the next few months.

Passage of a smoking ban by Congress would, therefore, be premature, and would subvert the OSHA regulatory process.

Some will no doubt say that this bill makes adequate provisions for those who wish to smoke in the workplace, but we disagree. It would allow smoking only in areas so ventilated that the air from those areas would never enter nonsmoking areas.

Two points. First, anyone who has ever eaten in a restaurant, rolled a line in a bowling alley or shopped in a mall knows that this condition cannot be guaranteed with certainty in any place where smokers and nonsmokers come together to relax and socialize.

Second, the quarantine imposed on environmental tobacco smoke by H.R. 3434 would exceed that imposed on all other substances.

This is a classic example of a disproportionate, unnecessary, unreasonable and inflexible legislative response.

Furthermore, Mr. Chairman, it allows smoking only in areas that nonsmokers do not enter for any purpose. And an example will show how absurd that is. Either smoking will be prohibited in any area that nonsmoking security guards and cleaning crews must enter, or smoking areas will be off limits to cleaning personnel and security guards. And the only way to solve that would be to require that employers hire at least some cleaning personnel and security guards who smoke.

What about the other allowances made for smokers? Can smokers just not leave the building in order to light up? The prohibition against smoking, quote, "within the immediate vicinity of the entrance", would force smokers to leave the building and walk down the street. But wait. It would apparently also forbid them from lighting up in the vicinity of the entrance to any other building. Thus, smokers would have to sacrifice additional break time, battle the weather, and run a gauntlet of entrances and immediate vicinities in order to find a place where H.R. 3434 will let them smoke.

The one person who will be grateful for H.R. 3434 is the professional anti-smoking activist, because it gives private parties the right to enforce the requirements of the bill. And anti-smoking zealots will be able to subject building owners and lessees who permit smoking to endless harassment. Their motto might become, "Where there is smoke, there is a lawsuit."

I fail to understand the reasoning behind the suggestion that it protects against lawsuits. Few lawsuits have been filed as a result. If H.R. 3434 were needed to save employers from an avalanche of lawsuits, one would have expected that avalanche to have begun before this time. And, in fact, it has not.

The relative infrequency of such lawsuits can be explained by several factors. First, the organized anti-smoking community appears to have been reluctant to submit to a judicial test the claim that environmental tobacco smoke is associated with adverse health effects. Because of the deficiencies of the scientific case against environmental tobacco smoke, that reluctance is entirely understandable.

Second, the courts have not been hospitable to the extreme measures commanded by anti-smokers, with most courts concluding that all that is required is reasonable accommodation of nonsmokers in public workplaces.

Finally, literally hundreds of smoking restriction measures have been approved by State and local legislative bodies over the last several years, making litigation by nonsmokers quite unnecessary.

If there is to be an avalanche of litigation, it will be because this bill is approved. If someone were to light up in an area where smoking is prohibited, the EPA would be obligated on request to attempt to resolve the dispute, and if unsuccessful, the Federal courts would be the next step. A party disappointed at the Federal level would be able to move up through the Federal judiciary, through and including the U.S. Supreme Court.

The implications of the scenario just described are rather preposterous. It has been said that there is very little red tape and administration. But the EPA, which does have jurisdiction and would

be forced to exercise it in any claim or lawsuit, has failed over the last few years to meet statutorily imposed deadlines set by Congress, and to ask it to take over the additional duties contemplated by this bill, which include deciding whether citizen X smoked a cigarette in a wrong place in the pool room in Cherokee, Iowa, would be a ludicrous waste of Federal resources.

In summary, the proposed smoking ban lacks scientific foundation. It is extreme, and does not make adequate allowance for the rights and interests of the 50 million adult Americans who smoke, and would waste Federal resources on a scale never before imagined. OSHA has the statutory authority to regulate workplace smoking and indoor and outdoor air quality, and is actively studying this matter. H.R. 3434 should not become the law.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Whitley follows:]

Statement of
Charles O. Whitley
on behalf of
The Tobacco Institute
before the
Subcommittee on
Health and the Environment
of the
Committee on Energy and Commerce
U.S. House of Representatives

February 7, 1994

Mr. Chairman, distinguished members of the Subcommittee and former colleagues. I appreciate the opportunity to appear before you today on behalf of The Tobacco Institute to discuss the proposed federal smoking ban in public buildings -- H.R. 3434, introduced by Rep. Henry Waxman. I am accompanied by Dr. Larry Holcomb.

H.R. 3434 would amend the Public Health Service Act by adding a title that would require smoking to be banned in every building in the United States that is regularly entered by 10 or more people at least one day a week. Smoking would be prohibited not only inside the building but also on facility property "within the immediate vicinity of the entrance." The bill would exempt only buildings or portions of buildings regularly used for residential purposes.

Smoking within a building could be allowed only in areas ventilated in accordance with specifications established by the Environmental Protection Agency to ensure that the air from the smoking area "is directly exhausted to the

outside and does not recirculate or drift to" nonsmoking areas. A smoking area, moreover, would have to be one that nonsmokers "do not have to enter for any purpose." EPA would be empowered to issue regulations to carry out the Act.

Under H.R. 3434, the responsibility for implementing the smoking ban would rest with the person who owns or leases the building. The bill would allow private parties, as well as governmental entities, to bring actions against building owners to enforce the requirements of the law.

H.R. 3434 is one of many federal, state and local responses to EPA's report classifying environmental tobacco smoke as a "Group A" carcinogen. I do not propose to discuss in detail the scientific deficiencies in the claim that exposure to environmental tobacco smoke poses health risks. I will leave that issue to Dr. Holcomb. I can say, however, that EPA's report is scientifically flawed and does not support the extreme measures found in H.R. 3434.

Mr. Chairman, I would like to focus on a curious irony at the outset. In H.R. 3434, we have a bill that, in essence, bans smoking in factories and office buildings as well as the local True Value Hardware, the local 7-Eleven, and almost all other workplaces; in restaurants, nightclubs, taverns, malls, bowling alleys, pool rooms and bingo halls; in union halls, VFW posts, and Knights of Columbus halls; in bus depots, train stations and airports; and in hotels and motels from the Willard to the Red Roof Inn. Did EPA consider actual exposure data from such places in reaching its conclusions about the health risks purportedly associated with

exposure to environmental tobacco smoke? No, it did not. EPA based its conclusion on studies of reported non-smoker exposure in the home. Yet, ironically, residences are the only places exempted from the H.R. 3434's smoking ban. The logic of this escapes me.

But it is clear that logic has little to do with H.R. 3434. In reality, this attempt to ban smoking is an example of social engineering on a vast scale. Such massive federal intervention in the private lives and choices of one quarter of our adult population recalls the extremism of Prohibition, the last national crusade against a supposed social evil.

One might suppose from H.R. 3434 that nothing is being done to regulate smoking in public places and places of employment throughout the nation. But state and local governments have enacted numerous laws banning smoking in places of employment and various public settings. Many businesses have voluntarily banned smoking in places of employment, and restaurants and other facilities open to the public have adopted smoking bans as well.

Congress, of course, has banned smoking on domestic flights. This ban is enforced by the Department of Transportation. Congress has also required WIC programs to ban smoking as a condition of receiving continued federal funding. Meanwhile, smoking in most federal buildings is severely restricted under regulations issued by the General Services Administration. The Department of Defense and other federal agencies have established additional controls. The Postal

Service has banned smoking in its facilities and Amtrak has severely limited smoking on its trains. The House of Representatives recently adopted rules restricting smoking in its buildings. Thus, there is simply no regulatory void for H.R. 3434 to fill.

Federal OSHA is the agency with the statutory authority to regulate workplace smoking and indoor air quality. OSHA has issued a Request for Information on indoor air quality issues, including issues related to environmental tobacco smoke, has received hundreds of comments and has commissioned studies regarding the alleged health effects of exposure to environmental tobacco smoke. OSHA is studying this matter and has stated that it will determine the appropriate regulatory response within the next few months. Passage of a smoking ban by Congress would, therefore, be premature and would subvert the OSHA regulatory process.

Some will no doubt say that H.R. 3434 makes adequate provisions for those who wish to smoke in the workplace. We disagree. The bill would allow smoking only in areas so ventilated that the air from those areas would never enter nonsmoking areas. Two points, Mr. Chairman. First, anyone who has ever eaten in a restaurant, rolled a line in a bowling alley or shopped in a mall knows that this condition cannot be guaranteed with certainty in any place where smokers and nonsmokers come together to relax and socialize. Second, the quarantine imposed on environmental tobacco smoke by H.R. 3434 would exceed that imposed on all

other substances. This is a classic example of a disproportionate, unnecessary, unreasonable and inflexible legislative response.

Furthermore, Mr. Chairman, the bill allows smoking only in areas that nonsmokers do not have to enter "for any purpose." An example will illustrate the absurdity of this condition. Either smoking will be prohibited in any area that non-smoking security guards and cleaning crews must enter or smoking areas will be off limits to cleaning personnel and security guards! The only alternative: require employers to hire at least some cleaning personnel and security guards who smoke!

What of the other "allowances" made for smokers? Can smokers not just leave the building in order to light up? The prohibition against smoking "within the immediate vicinity of the entrance" to a facility would force smokers to leave the building and walk down the street. But wait. H.R. 3434 apparently would also forbid smokers from lighting up in the vicinity of the entrance to any other building. Thus, smokers would have to sacrifice additional break time, battle the weather, and run a gauntlet of entrances and "immediate vicinities" in order to find a place where H.R. 3434 will let them smoke.

One person who will be grateful for H.R. 3434 is the professional antismoking activist. H.R. 3434 gives private parties the right to enforce the requirements of the bill. As a result, antismoking zealots will be able to subject building owners and lessees who permit smoking to endless harassment. Their

motto might become "where there's smoke, there's a lawsuit." Does Congress really wish to be seen encouraging lawsuits against small private businesses and employers?

Some have actually suggested that H.R. 3434 will protect employers and others from an avalanche of legal claims by non-smokers. I fail to understand the reasoning behind that suggestion. Although claims have been made for many years that environmental tobacco smoke is associated with lung cancer, few lawsuits have been filed as a result. If H.R. 3434 were needed to save employers from an avalanche of lawsuits, one would have expected the avalanche to have begun by this time. In fact, it has not.

The relative infrequency of lawsuits over smoking in public places and workplaces can be explained by several factors. First, the organized antismoking community appears to have been reluctant to submit to a judicial test the claim that environmental tobacco smoke is associated with adverse health effects. Because of the deficiencies of the scientific case against environmental tobacco smoke, that reluctance is entirely understandable. Second, the courts have not been hospitable to the extreme measures demanded by antismokers, with most courts concluding that all that is required is reasonable accommodation of non-smokers in public places and workplaces. Finally, literally hundreds of smoking restriction measures have been approved by state and local legislative bodies over the past several years, making litigation by nonsmokers quite unnecessary.

A smoking ban will not eliminate the threat of lawsuits over indoor air quality. Indeed, a smoking ban would create a false sense of security and discourage measures to improve general indoor air quality, thereby increasing the risk of lawsuits over exposure to a host of indoor air pollutants.

If there is to be an avalanche of litigation over smoking in public places and workplaces, it will be because H.R. 3434 has been approved. As noted, H.R. 3434 would make the federal government a party to most every smoking dispute that might arise, anywhere in the country. If someone were to light a cigarette in an area in which smoking has been prohibited -- or arguably prohibited -- under H.R. 3434, the Environmental Protection Agency would be obligated, on request, to attempt to resolve the dispute. If unsuccessful, the federal courts would be the next point of appeal, having jurisdiction under H.R. 3434 to hold trials on smoking disputes wherever and however such disputes arise. A party disappointed at the trial level would be able to move the dispute up through the federal judiciary, through and including the U.S. Supreme Court.

The implications of the scenario just described are, we respectfully submit, rather preposterous. The U.S. Environmental Protection Agency has failed on numerous occasions over the past several years to meet statutorily imposed deadlines set by Congress. Asking the Environmental Protection Agency to take on the additional duties contemplated by H.R. 3434 -- which would include the duty of deciding whether Citizen X had smoked a cigarette in the wrong location

within a poolroom in Cherokee, Iowa -- would be a ludicrous waste of federal resources. Requiring the federal courts in Iowa to step in if the Environmental Protection Agency failed to resolve the dispute would be, if anything, even more ridiculous.

Let me sum up. The proposed smoking ban lacks scientific foundation. It is extreme and does not make adequate allowance for the rights and interests of the fifty million adult Americans who smoke. And it would waste federal resources on a scale never before imagined. OSHA has the statutory authority to regulate workplace smoking and indoor air quality, and it is actively studying this matter. H.R. 3434 should not become law.

I will be glad to answer any questions.

Mr. WAXMAN. Thank you very much, Mr. Whitley, for your testimony to us.

You have likened this legislation to Prohibition, and you also raise the analogy to social engineering, in arguing that it is social engineering on a vast scale. The analogy to Prohibition is a good one, because not that this legislation is in any way like Prohibition, but it is like drunk driving. We regulate how people who drink affect other people. We don't tell people they can't drink. We don't tell smokers they can't smoke. But it seems to me to be reasonable to say, Smokers, your rights end where other people's rights are going to be infringed. It is not just their rights, it is their health, because we are talking about a grade A carcinogen, according to the Environmental Protection Agency.

When people drink and smoke in a way that affects others, it is not social engineering to regulate that conduct. It is good public policy.

Do you want to respond to that?

Mr. WHITLEY. Yes, Mr. Chairman. In the first place, I don't think the Federal Government is the governmental agency that regulates drinking and that sort of thing. It is left up to States and local communities, which basically have that type of power and authority and responsibility under the Constitution.

Beyond that, Mr. Chairman, there is a lot of difference in reasonable regulation, and a total ban. There is no evidence whatsoever that a total ban on smoking in the places that your bill would ban it is necessary to protect the health of people.

Mr. WAXMAN. We don't call for a total ban. What this legislation says is that the rights of the nonsmokers must be protected, and that businesses may either have a separate section that is separately ventilated, or they may choose to ban smoking completely in order to protect those who do not choose to smoke.

The Building Owners and Management Association have called on us for Federal legislation. They want a level playing field. They don't want to be subjected to every jurisdiction at the local level and how they may choose to regulate these issues. And they also don't want to spend the enormous amount of money that they have to spend on repainting and the upkeep of their buildings because of the damage that the smoking does just to their buildings.

If they are concerned about their buildings, shouldn't the Congress of the United States be concerned about the health of the people that are in those buildings?

Mr. WHITLEY. Let me respond to that in two ways, Mr. Chairman. Your first statement was that your bill is not a total ban, that it permits smoking in totally separately ventilated places in which no air can circulate anywhere else in the building, in which no one who is not a smoker enters. For all practical purposes, Mr. Chairman, that is a de facto ban.

The cost maintaining that kind of facility, the restriction of keeping everybody out of that part of the building that doesn't smoke, totally separating parts of restaurants from other parts, and then the waiters and cleaning people and all couldn't even go in, we think it is a de facto ban.

In the second place, the statement about the building owners, I can understand why building owners would rather ban smoke than

clean up their air. We have the same kind of thing with the aircraft owners, when we were looking at smoking bans in aircraft cabins. They thought it was fine because they didn't want to do what it took to really clean up the air. They didn't. Now we are getting complaints from flight attendants that they still have lousy air in aircraft cabins.

Mr. WAXMAN. If you think there is some motivation for building owners to want to avoid the high costs of having to maintain their buildings because of the damage from cigarette smoke, don't you think there is a reasonable expectation that the Surgeons General of the United States think that because of the damage to public health, especially to children, that we ought to prevent them having to be forced involuntarily from smoking, from breathing in this grade A carcinogen?

Mr. WHITLEY. Mr. Chairman, I am not sure I understand the thrust of your question.

Mr. WAXMAN. It seems like you are questioning the motivation of these building owners because they want to avoid the costs of having to maintain these buildings. I think we ought to recognize they have a cost, but more importantly, there is a public cost, a human cost, from a grade A carcinogen which people are forced involuntarily to breathe in and expose themselves to.

Mr. WHITLEY. Mr. Chairman, the EPA itself wound up having a sick building a number of years ago. It was determined in a study that the quality of the air in that building was very bad. The adequacy of the ventilation system and the filtering system was resulting in a lot of clean air problems.

Now, the building owners, if will you permit me to answer your question, Mr. Chairman, the building owners would much rather say, OK, the environmental tobacco smoke has been banned, now we have clean air in our buildings. They would rather do that than have to increase their cost of heating and cooling, have to call in experts to clean out all their ventilation, to put in more filters, and to actually clean up the air. Not just environmental tobacco smoke, but a number of other substances have been classified as group A carcinogens and other contaminants as well. They don't want to have to comprehensively clean up their building.

Mr. WAXMAN. It seems to me they are acting quite reasonably if they want to avoid all the extra cost to them. And I think we would be acting quite reasonably if we avoided the extra costs to children from exposure to a grade A carcinogen, and other people, and all the medical costs that are going to be associated with taking care of the diseases that are related to environmental tobacco smoke.

Mr. WHITLEY. Mr. Chairman, I will let my associate here, Mr. Holcomb, address specifically scientific questions. But in regard to children, I will say that we are not aware of studies that have been done in the types of facilities that are banned in your bill that have demonstrated a health risk from environmental tobacco smoke in children. The studies that we know about were done in residences, which are not included in your bill.

Mr. WAXMAN. Well, I can tell you, I could refer you to these children that came before our subcommittee 6 months ago, who told us that they couldn't go into a restaurant or a bowling alley because if they had to breathe in the tobacco smoke, they had an asthma

attack triggered, and many times had to be taken to the hospital as a result of it. Their words are eloquent statements to me and to everyone else that there are people that are susceptible to this in the extreme form, and the Environmental Protection Agency has told us that everyone is susceptible to it when they have to breathe it in involuntarily because smoke is a class A carcinogen.

But I wanted to let Mr. Bliley, maybe he will get—

Mr. WHITLEY. Mr. Chairman, may I comment on this?

Mr. WAXMAN. I am not asking you a question. I am making a statement. I have asked you questions. I am going to let Mr. Bliley engage in questions, and perhaps you can pick up some of the points you want to make.

Mr. BLILEY. Mr. Chairman, thank you.

Dr. Holcomb, are you familiar with a firm called Healthy Buildings, International?

Mr. HOLCOMB. Yes, I am.

Mr. BLILEY. As I understand it, and correct me if I am wrong, this company analyzes the air quality in public buildings around the world?

Mr. HOLCOMB. Yes, they do.

Mr. BLILEY. Are you further familiar with a study they did of environmental tobacco smoke in restaurants in Albuquerque, NM, which pointed out that in order for you to get the nicotine equivalent of one cigarette from environmental tobacco smoke, you would have to continuously sit for 1,705 hours in the nonsmoking section of the restaurant?

Mr. HOLCOMB. That sounds about right. I have done similar calculations.

Mr. BLILEY. Thank you very much.

Dr. Elders states in her testimony that secondhand tobacco smoke has toxic and carcinogenic effects that are very similar to mainstream smoke. Do you agree?

Mr. HOLCOMB. I don't agree at all.

Mr. BLILEY. Would you explain?

Mr. HOLCOMB. Environmental tobacco smoke is a diluted material, diluted perhaps hundreds, if not thousands of times from side-stream smoke.

To give you an example, Dr. Elders and others who are particularly anti-smoking may say there are 40 carcinogens found in side-stream smoke and equate that to ETS. I would challenge anyone to find 2 or 3 of them, let alone 40, in the ambient air. They are so dilute—people have tried to find them. The only place that you find them is in this very concentrated side-stream smoke, right over the tip of the cigarette. Once that smoke travels even that far, it begins oxidizing, disappears entirely from many of those materials, or is diluted to the point where you can't even measure it.

As an environmental toxicologist, my response is, if you can't measure it at all, then it is not, certainly not significant in terms of the potential health threat.

Mr. BLILEY. Dr. Holcomb, how much do we know about how ETS reacts with other air in the room? For example, you already pointed out how fast it becomes diluted. Did EPA take any of this information into account when it did its risk assessment?

Mr. HOLCOMB. It did not. As a risk assessor on a day-to-day basis and having to respond to EPA criteria for doing a risk assessment, one of the items is, what is the concentration of material to which these people may be exposed. And I sent the material, many people sent the material to review. It is the dose of exposure that is critical, the amount that is in the air and the amount you breathe in over a period of time. And they did not take that into consideration.

The initial report, the draft report started to. And then they backed off, I think for very evident reasons, that it was leading to a direction that would show that the dose of exposure is extremely low.

The animal studies that are required to be reviewed in a risk assessment were not reviewed. If they were reviewed, they were not included in the report. And what those animal studies show are that there is no threat of lung cancer, that there is no threat of other respiratory diseases.

Mr. BLILEY. Thank you.

Dr. Holcomb, you mentioned that ventilation is an approach that tackles all indoor air quality problems, and that the American Society of Heating, Refrigeration and Air Conditioning Engineers' standard for ventilation has been widely adopted. Does this standard apply to just offices or does this standard also cover restaurants and other public areas?

Mr. HOLCOMB. This standard, and I have elaborated on that in my written testimony—and I will provide you, by the way, with a document that I have written and published in a peer review journal, 1993, and I would like to make sure each member of the committee gets a copy of that.

Mr. BLILEY. Mr. Chairman, can I ask unanimous consent to have that put in the record?

Mr. WAXMAN. Without objection, we will be pleased to receive that for the record.

[Testimony resumes on p. 220.]

[The information follows:]

INDOOR AIR QUALITY AND ENVIRONMENTAL TOBACCO SMOKE: CONCENTRATION AND EXPOSURE

Larry C. Holcomb

Holcomb Environmental Services, 17375 Garfield Rd., Olivet, MI 48076, USA

EI 9109-174 M (Received 10 September 1991; accepted 1 August 1992)

Environmental tobacco smoke (ETS) is often cited as a key factor in indoor air quality (IAQ) and public health. However, there are few studies which attempt to actually calculate the impact ETS has on IAQ or the doses of ETS one may receive from possible exposure in a variety of different settings. This paper reviews the data on indoor air published since 1980 and estimates the portion of various constituents which are produced by ETS. It can be observed that, in most instances, ETS has only a minor impact on IAQ. Retained doses of ETS particles are calculated for various exposure scenarios using respirable particle concentrations associated with ETS, time activity patterns, respiration rates and retention rates. Total doses range from 3-40 mg/y. This dose level does not seem to support the summary relative risk of 1.35 that has been claimed from meta-analyses of epidemiologic studies of spousal smoke exposure and lung cancer.

INTRODUCTION

Interest in indoor air quality (IAQ) is steadily increasing. The factors which affect IAQ and the health effects reportedly associated with it are the subject of intense debate. One of the IAQ issues which generates the most interest and emotion is environmental tobacco smoke (ETS) exposure and its reported health effects. ETS exposure has been claimed to be associated with health effects as diverse as childhood respiratory disease, lung cancer, and cardiovascular disease (Repace and Lowrey 1985; U.S. Surgeon General 1986; National Research Council 1986; Wells 1988; Glantz and Parmley 1991; USEPA 1990).

ETS is a complex mixture of many substances, the concentrations of which will vary with time, room ventilation, and proximity to the source. Since not all

of its components are removed from the environment at the same rate, the concentrations of ETS components also vary in relation to each other over time. Because of this, it is difficult to accurately determine exposure to ETS and, further, whether the health claims are realistic in terms of this exposure.

Sterling et al. (1982) performed a comprehensive review of components of ETS measured in different environments and under different smoking conditions. Since that review was completed, there have been many changes in both indoor environments and analytical methodology. Because of this, a new review of the literature pertaining to indoor air quality and environmental tobacco smoke is appropriate.

This study assesses the literature on indoor air quality and ETS published since 1980. Using the data collected, it also attempts to determine what levels

of substances measured indoors may result from the presence of ETS and calculates some of the doses which may be expected from exposure to ETS.

INDOOR AIR AND ETS REVIEW

Methods

The literature search was restricted to work which took place in the U.S. and Canada and was published after 1980. There is important IAQ data being generated in European and other countries. However, potential differences in building age, ventilation types, room sizes and other factors may prevent data from other countries from being comparable to the U.S./Canadian data. This study limited the literature to the countries where the data were believed to be more homogeneous and essentially reviewed the literature published since the Sterling et al. (1982) review.

The following indoor air components were chosen for evaluation: respirable particulates (RSP); carbon monoxide; nicotine; nitrogen dioxide; formaldehyde; benzene; polycyclic aromatic hydrocarbons (PAH); and nitrosamines.

When it was obvious that structures and sampling protocol for data acquired in countries outside North America were similar, it was included with the USA/Canada data. In instances where relatively little information was available or the data from all countries were similar, information from other countries also was used.

The information was recorded in the following categories:

1. Homes—includes single family dwellings and apartments.
2. Offices, workplaces, and public facilities—includes offices, work sites, schools, universities, hospitals, retail stores, museums, libraries, clinics, grocery stores, laundromats, and public transportation stations.
3. Restaurants
4. Bars/taverns—includes betting shops, billiard parlors, bars, and taverns.
5. Public transportation—trains, buses, subway, and autos.

The data were selected from the literature using the following criteria:

If no mean was given, generally, the data were not reported in this document unless there were individual values given to make it possible to calculate a mean. If there were 10 or more samples and a median was given, the data were reported. Both arithmetic and geometric means are reported. If an

arithmetic mean was given, it was used in any subsequent calculations.

If only one value was given (i.e., one sample) the data were not used because one sample at one point in time is not as representative of conditions as several samples at different points of time or for longer duration.

For respirable particulates, if the data were reported as total particulate matter (TPM), the data were not used. If the sample was PM 5.0 or less, the data were reported.

The data were recorded with a preference for gravimetric data on RSPs. When gravimetric, light scattering, and piezobalance data were all present, the gravimetric data were used. If data from only one of these three methods were present, these data were used.

This paper focuses upon the scientific literature pertaining to the quantification of indoor air quality. Hence, the papers reviewed are those that have measured levels of substances in indoor air. Odor may play a part in the acceptability of indoor air to occupants or visitors to any particular environment, but the evaluation of odor in offices is as yet somewhat subjective and poorly quantified. ETS clearly may influence odor perception in some situations, and the existing scientific literature on this matter has been reviewed. Because of both the scarcity of data on this issue and the subjectivity of the data that do exist, odor has not been considered as a quantified element in the data tabulated in this report.

Results

The results of the literature review on indoor air components are in Tables 1-8. Each table is a summary of one of the components reviewed. Units of measurement in the tables are reported the same as authors presented them in their studies. Conversion factors for ppm (parts per million) and ppb (parts per billion) to $\mu\text{g}/\text{m}^3$ are given where appropriate. Tables 9, 10, and 11 summarize the data for RSPs, CO, and nicotine. Nitrogen dioxide, formaldehyde, benzene, PAH, and nitrosamine data are summarized in the discussions.

DOSIMETRIC CALCULATIONS

Methods

The particle fraction of ETS is the portion on which the majority of the health claims concentrate. An estimate of the dose of ETS particles that persons

Author & Date	Country	Building Type	Occupancy	Wind U-Value	3-mph Wind	Case-Controlled
Carlson & Erikson (1968)	Canada	Offices (33)	± 2 people w/min. 1 smoker	Not Given	Not Given	$\frac{U_{PMV}}{U_{PMV} + U_{PMV}^2}$ C. Mean 24.426 Range 17 - 86
Covey, et al. (1986)	USA	Homes (10) Restaurants (10)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ Homes, A. Mean 58 Std., Range 18 - 306 Rest., A. Mean 160 Range 17 - 86 UPMV (log/m³) 1 - 8 4.2 15 - 223 106
Covey, et al. (1988)	USA	Offices (10) Planes (5)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ Offices, Range 18 - 446 A. Mean 100 PMV 1 - 127 Planes, Range 35 - 119 20 - 106 (Smoking Section) Planes, A. Mean 72.6 (Smoking Section) Planes, Range Sect. 5 - 98 12 - 30 (Smoking Section) Planes, A. Mean 22 18.6 (Non Smoking Sect.)
Coulas, et al. (1990a)	USA	Workplaces	Not Given	Not Given	Not Given	$\frac{AVG. ESP}{U_{PMV} + U_{PMV}^2}$ Police 2 Hospital 2 Offices 2 Restaurant 2 Shop 2 Restaurant 1 Retail Store 1 66.15 30.75 40.25 115.8 85.2
Coulas, et al. (1990b)	USA	Homes (10)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ Families 3 Hospital 3 Office 3 Public Trans. 1 32.6 - 76.9 μg/m³ ESP Means
Cousins & Collett (1989)	Canada	Schools (5) Portables (6)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ Old School 11 Indoor 11 Outdoor 25 10 - 17 10 - 20 15 11 - 279 11 - 84 16 - 366 10 - 194
Crouse & Carlson (1980)	USA	Offices (32) Offices & Restaurants (36)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ Offices ESP 61 UPMV 47 Restaurants ESP 111 UPMV 51 11 - 279 11 - 84 16 - 366 10 - 194
Crouse, et al. (1988)	USA	Restaurants (37)	Not Given	Not Given	Not Given	$\frac{ESP}{U_{PMV} + U_{PMV}^2}$ ESP 62 ± 2.2 UPMV 26.1 ± 1.9 16 - 221 15 - 148

USA	Office (1)	Not Given	Not Given	12 hours	"particles" ... 31 $\mu\text{g}/\text{m}^3$ Aug.
Mollweil and Mitsch (1981)	Canada	Not Given	Not Given	Gravimetric (BSP) 24 hr. samples	$\text{BSP } (\mu\text{g}/\text{m}^3)$ AC No AC Smoke (n=11) 60.5 (n=25) 70.11 No Smoke (n=4) 34.3 (n=11) 32.5 Carpet No Carpet Smoke (n=28) 76.6 (n=8) 70.2 No Smoke (n=9) 50.7 (n=7) 53.7 Not later Smoke 64.5 51.1 No Smoke 60.7 37.7
Wagner, et al. (1981)	USA	Restaurants (38) Offices (28)	Varied	Gravimetric PM2.5 PASS Unit 1 Hour Samples	$\text{BSP } (\mu\text{g}/\text{m}^3)$ nd: 75 Offices: Range 116 Restaurants: Range 116 Restaurants A.: Mean 120 nd: 108 nd: 127 nd: 33.2
Lendrer, et al. (1990)	USA	Restaurants (196)	Not Given	Gravimetric PM2.5	$\text{Sulfate } (\mu\text{g}/\text{m}^3)$ nd: 108 nd: 127 nd: 33.2
Loftis, et al. (1989)	USA	Restaurants (1)	Not Given	Gravimetric 1SP & Piezobalance	$\text{Sulfate } (\mu\text{g}/\text{m}^3)$ nd: 108 nd: 127 nd: 33.2
McCarthy, et al. (1987)	USA	Restaurants (685, 1305)	Not Given	Gravimetric (BSP) Personal & Area Samples (24 hr)	$\text{Sulfate } (\mu\text{g}/\text{m}^3)$ nd: 108 nd: 127 nd: 33.2
Wagner, et al. (1988)	USA	Public Places, Offices (19)	Varied	Gravimetric PM2.5 5-16 hours	$\text{Sulfate } (\mu\text{g}/\text{m}^3)$ nd: 108 nd: 127 nd: 33.2

Range ($\mu\text{g}/\text{m}^3$)	A. Mean ($\mu\text{g}/\text{m}^3$)
0.00-0.05	0.01
0.05-0.10	0.07
0.10-0.15	0.12
0.15-0.20	0.18
0.20-0.25	0.23
0.25-0.30	0.28
0.30-0.35	0.33
0.35-0.40	0.38
0.40-0.45	0.43
0.45-0.50	0.48
0.50-0.55	0.53
0.55-0.60	0.58
0.60-0.65	0.63
0.65-0.70	0.68
0.70-0.75	0.73
0.75-0.80	0.78
0.80-0.85	0.83
0.85-0.90	0.88
0.90-0.95	0.93
0.95-1.00	0.98
1.00-1.05	1.03
1.05-1.10	1.08
1.10-1.15	1.13
1.15-1.20	1.18
1.20-1.25	1.23
1.25-1.30	1.28
1.30-1.35	1.33
1.35-1.40	1.38
1.40-1.45	1.43
1.45-1.50	1.48
1.50-1.55	1.53
1.55-1.60	1.58
1.60-1.65	1.63
1.65-1.70	1.68
1.70-1.75	1.73
1.75-1.80	1.78
1.80-1.85	1.83
1.85-1.90	1.88
1.90-1.95	1.93
1.95-2.00	1.98
2.00-2.05	2.03
2.05-2.10	2.08
2.10-2.15	2.13
2.15-2.20	2.18
2.20-2.25	2.23
2.25-2.30	2.28
2.30-2.35	2.33
2.35-2.40	2.38
2.40-2.45	2.43
2.45-2.50	2.48
2.50-2.55	2.53
2.55-2.60	2.58
2.60-2.65	2.63
2.65-2.70	2.68
2.70-2.75	2.73
2.75-2.80	2.78
2.80-2.85	2.83
2.85-2.90	2.88
2.90-2.95	2.93
2.95-3.00	2.98
3.00-3.05	3.03
3.05-3.10	3.08
3.10-3.15	3.13
3.15-3.20	3.18
3.20-3.25	3.23
3.25-3.30	3.28
3.30-3.35	3.33
3.35-3.40	3.38
3.40-3.45	3.43
3.45-3.50	3.48
3.50-3.55	3.53
3.55-3.60	3.58
3.60-3.65	3.63
3.65-3.70	3.68
3.70-3.75	3.73
3.75-3.80	3.78
3.80-3.85	3.83
3.85-3.90	3.88
3.90-3.95	3.93
3.95-4.00	3.98
4.00-4.05	4.03
4.05-4.10	4.08
4.10-4.15	4.13
4.15-4.20	4.18
4.20-4.25	4.23
4.25-4.30	4.28
4.30-4.35	4.33
4.35-4.40	4.38
4.40-4.45	4.43
4.45-4.50	4.48
4.50-4.55	4.53
4.55-4.60	4.58
4.60-4.65	4.63
4.65-4.70	4.68
4.70-4.75	4.73
4.75-4.80	4.78
4.80-4.85	4.83
4.85-4.90	4.88
4.90-4.95	4.93
4.95-5.00	4.98
5.00-5.05	5.03
5.05-5.10	5.08
5.10-5.15	5.13
5.15-5.20	5.18
5.20-5.25	5.23
5.25-5.30	5.28
5.30-5.35	5.33
5.35-5.40	5.38
5.40-5.45	5.43
5.45-5.50	5.48
5.50-5.55	5.53
5.55-5.60	5.58
5.60-5.65	5.63
5.65-5.70	5.68
5.70-5.75	5.73
5.75-5.80	5.78
5.80-5.85	5.83
5.85-5.90	5.88
5.90-5.95	5.93
5.95-6.00	5.98
6.00-6.05	6.03
6.05-6.10	6.08
6.10-6.15	6.13
6.15-6.20	6.18
6.20-6.25	6.23
6.25-6.30	

[illegible]

Author(s)	Year	Location	Sample Type	Sample Size	Sample Period	Sample Frequency	Sample Duration	Sample Method	Sample Analysis	Sample Results	Sample Comments
Quarstein, et al.	1990	USA	Gravimetric PM2.5	Stationary	Personal	Outdoor	101	42.72	23.97	8.96-116.87	Range: 19.5/m ³
Proctor (1989)	1989	UK	Gravimetric PM2.5	Pass Unit, 1 hr Samples							Range: 19.5/m ³
Proctor, et al. (1989b)	1989b	UK	Gravimetric PM2.5	5 times each							Range: 19.5/m ³
Quarstein, et al. (1989a)	1989a	USA	Gravimetric PM10 & PM2.5								Range: 19.5/m ³
Quarstein, et al. (1991)	1991	USA	Gravimetric PM2.5	2 weeks of sampling							Range: 19.5/m ³
Santana, et al. (1990)	1990	USA	Gravimetric PM2.5	1 week samples							Range: 19.5/m ³
Sheldon, et al. (1988a)	1988a	USA	Dichotomous Impactors	2.5 µm							Range: 19.5/m ³

Author(s)	Year	Location	Study Design	Exposure	Outcome	Notes
Spengler, et al.	1985	USA	Case-control	Gravimetric PM _{2.5}	Respiratory illness	Range of Means - Homes
Spengler, et al.	1987	USA (6 cities)	Case-control	Particle Sampler PM _{2.5} week long sample	Respiratory illness	Range of Means - Homes
Sterling & Mueller	1988	Canada	Cohort	Mechanical/Recirculated Air	Light Scattering, Digital Dust Counter	Range of Means - Homes
Sterling, et al.	1988	USA & Canada	Cohort	Not Given	Not Given	Range of Means - Homes
Thomas, et al.	1989	USA	Cohort	Gravimetric PM _{2.5} 2 yr (for 14 days) (Lunchtime)	Respiratory illness	Range of Means - Homes
Turner, et al.	1991	USA	Cohort	Pneumonia	Respiratory illness	Range of Means - Homes
Weschler and Shields	1989	USA	Cohort	Gravimetric PM _{2.5} 1 week samples	Respiratory illness	Range of Means - Homes
Weschler	1992	USA	Cohort	Resp. Part. Matter PM _{2.5}	Respiratory illness	Range of Means - Homes

Table 2 Carbon monoxide (ppm) measured under realistic conditions (Conversion factor: 1 ppm = 1.15 mg/m³)

Author & Date	Country	Building Type	Occupancy	Ventilation	Instrument	Indoor (ppm)	Outdoor (ppm)	Portables
Carson & Ericson (1985)	Canada	Offices (31)	22 people w/min. 1 smoker	Not Given	Electrochemical Detector in PASS Unit, 1 sample/minute	A. Mean 1.9 G. Mean 1.3 Min. 0.1 Max. 5.7 No. of offices 28	1.9 1.9 1.2 4.1 5.8 21	0.9 0.9 0.8-1.0 1.1 1.1
Cousins & Collett (1989)	Canada	Schools (3)	Not Given	Not Given	Electrochemical Analyser	Old School 1.3 Renovated School 1.1 New School 0.9	0.7-1.5 1.1 0.9	0.9 1.1 1.1
Crouse, et al. (1989)	USA	Offices (10) Restaurants (10)	Not Given	Not Given	PASS Unit, Electrochemical Detector	Offices: Outdoors 29 Offices: Indoors 29 Restaurants: Outdoors 31 Restaurants: Indoors 31	A. Mean (ppm) 0.2-7.2 0.6-7.1 0.2-9.2 0.4-12	2.6 2.5 3.4 5.0
Crouse, et al. (1988)	USA	Restaurants (30)	Not Given	Not Given	PASS Unit	CO (1st-3) 35	Range 0.9-6.3 A. Mean 2.4	1.3
Lady, et al. (1987)	USA	Restaurant	Not Given	Not Given	Electrochemical Analyser, Sample every 10 mins. during 48 hr runs	Range 0-15 A. Mean 4 ppm	10 ppm	
Firth (1983)	USA	Public Places	Various	Not Given	Ecolyzer	Site Chamber 1 Chamber 2 School cafeteria School cafeteria Laverie Laverie Laverie Bus terminal Bus terminal Fast food Restaurant Sm. Sitdown Rest. Sm. Sitdown Rest.	Avg. Conc. (ppm) 2.0 - 1 cfb. smoked 1.5 - 1 cfb. smoked 1.0 - no smokers 0.5 - 2-3 smokers 0.0 - 3 smokers 0.0 - 3 smokers 7.0 - mostly smoker 3.5 - 50-100 people, 1-5 smokers 12-0-2.5 5.0 - 1-3 smokers during sampling 6.0 - 15 diners, 4 smokers 6.5 - 23 diners, 1 smoker	
Flachbart, et al. (1987)	USA	Car (8) Bus (4) Train (3)	Not Given	Not Given	Electrochemical Detector No Smoking	A. Range of Means (ppm) Automobile 213 Bus 35 Train 8 Remainder of trips	8.6 - 22.3 3.7 - 10.2 2.0 - 5.2	11.0 6.0 2.85
Hodge, et al. (1990)	USA	Office Building (2)	Not Given	Not Given	Direct Reading Interscan 4000 Hourly Samples	A. Mean (ppm) AM PM	0.0 0.0 2.3 2.8 2.6	0.0 0.0 1.7 2.6 2.6

Table 2 Continued.

II Corp. (1987)	USA	Offices (18) Restaurants (16)	Not Given	Variable	Not Given	Electrochemical Detector, sampled each min. for 60 min.	Offices		Restaurants	
							Range (ppm)	0.5 - 6	0.4 - 9	3.1
							4. Mean (ppm)	1.9		
Lofroth, et al. (1989)	USA	Lavern	5-25 people	Not Given	180 m ³	Electrochemical Detector	First Study (JUL)		Second Study (JUL)	
							Indoor Outdoor	4.4 mg/m ³ 4.1 mg/m ³	4.8 mg/m ³ 1.2 mg/m ³	
Murdock, et al. (1990)	USA	Mobile Homes	Not Given	0.5 ACH	SPE CO Detectors		H ² Sulfide Heat On		H ² Sulfide Heat Off	
							A. Mean Maximum	30 7.4 ppm 30 11.5 ppm	37 1.5 ppm 37 1.5 ppm	
Proctor, (1989)	UC	Offices (10) Train Comp. (20) app. 753 (105, 10M)	Not Given	Mechanical	Electrochemical Detector, 1 sample/minute		CO Range		CO A. Mean (ppm)	
							Offices (5) Offices (5) Trains (5)	0.5 - 3 0.5 - 3 1 - 2.2	1.4 1.2 1.4	
							Trains (45)	0.5 - 2.9	1.3	
Proctor, et al. (1989a)	UC	Betting Shops (6)	Not Given	Mechanical	Electrochemical Detector		H ² Range (ppm)		A. Mean	
							Indoor Smoking Indoor N-Smoking Outdoor	11 3.6-9.4 2 2.8-3.4 18 2.8-9.0	5.1 3.1 4.4	
Proctor, et al. (1989b)	UC	Office Building (1)	26 m ² /person	Not Given	Electrochemical Detector, (live 1 hr continuous samples)		Smoking Mean		Median	
							Smoking Mean Median Non smoking Mean	1.4 ppm 1.1 ppm 1.2 ppm	1.4 ppm 1.1 ppm 1.2 ppm	
Sterling & Muller (1988)	Canada	Office Buildings (2)	73-1.8/10m ²	Mechanical recirculation 24 hr, 20 cfm/ person fresh air	Electrochemical Detector, 4 min. samples, 6/location		Smoking Catechris		Buildings (2) A. Mean (ppm)	
							Smoking Catechris Non Smoking Catechris Non Smoking Offices	112 182 2	2.6 2.6 1.35	
Sterling, (1988)	Canada	Office Building	79/10m ²	forced Air; recirculation Min. 20 cfm/ person fresh air	Electrochemical Analyzer, 3-4 min. samples, 3/location		Smoking Prohibited		A. Mean (ppm)	
							Smoking Permitted Smoking Permitted Designated Smoking	2.1 2.1 4.2	2.1 2.1 4.2	
Sterling, et al. (1988)	North Am.	Offices	Not Given	Not Given			CO (ppm) 241		Range	
							NO - 245	2.65		
Thomas, et al. (1989)	USA	Industrial Catechris	30-9 people 560 m ³	8.8 ACH 5,400 cfm	Electrochemical Sensor, 120 samples/day for 12 days		Average Concentration (ppm)		Range	
							Lunchtime Background	2.9 0.8	2.9 0.2	
Turner, et al. (1991)	USA	Offices (585)	126.5 ft ² / person	Not Given	Electrochemical Detector, 10 readings/hour.		CO (ppm) A. Mean		Range	
							Smoking Non Smoking Total	331 254 585	3.40 3.13 3.29	
Tullit & Comeau (1989)	Canada	Home (76)	Not Given	0.29 ACH (0.0-1.33)	CO instrument		Living Room		A. Mean (ppm)	
							Assessment Bedroom	69 73	0.7 0.4	0.0 - 4.0 0.0 - 3.0

[illegible]

Table 3 Continued

II Corp. (1987)	USA	Offices (128) Restaurants (36)	Not given	Pump w/140-4 Sorbent 1 hr. Samples	Range A. Mean	Offices ($\mu\text{g}/\text{m}^3$) nd. 6	Restaurants ($\mu\text{g}/\text{m}^3$) nd. 12
Jenkins, et al. (1988)	USA	Restaurants (36)	Not Given	Personal Pump w/ Tenax Sorbent. 1 hr. Samples	Range A. Mean	0.5 - 37.2 5.78	(Offices & Restaurants sampled had no smoking restrictions)
Lofroth, et al. (1989)	USA	Tavern	5, 23 10um	Pump w/ filter 3 & 4 hr. Samples	71 $\mu\text{g}/\text{m}^3$	1st Study (3hr)	2nd Study (4hr)
McCarthy, et al. (1989)	USA	Homes (81) 685, 1385	Not given	Pump w/ Sodium Bisulfate Filter. Personal & Area Samples	Per. (15) Personal (5) Home (45)	Mean Median Range ($\mu\text{g}/\text{m}^3$) 0.0 - 1.0 0.0 - 1.0 0.0 - 12.0	Personal samples done on children 8-11 yrs old
Meisner, et al. (1989)	USA	Public Buildings (11)	Not Given	Pump w/Sodium Bisulfate Filter	Bar (5) Bar/Rest (5) Bar/Rest 2 (5) Subway St. (45) Hospital (5) Clinic Office Bldg (5) Office Bldg (45) Office Bldg (45) Office Bldg (5) Office Bldg (5)	n A. Mean ($\mu\text{g}/\text{m}^3$) 2 2.75 2 2.85 1 1.0 1 1.6 1 0.6 1 0.6 2 3.15	Office Bldgs 1 28.5 (res. Smoking Area in MS Building)
Oldaker, et al. (1988)	USA	Offices (48) Restaurants (49)	Not Given	Pass Unit w/140-4 Sorbent	G. Mean A. Mean Range	3.3 4.3 1.0 - 16.3	Offices ($\mu\text{g}/\text{m}^3$) Restaurants ($\mu\text{g}/\text{m}^3$) 4.3 6.2 0.7 - 15.6
Oldaker, et al. (1990)	USA & Canada	Offices & Restaurants (4 Cities)	Min. 2 people/office 1 smoker	PASS UNIT w/140-4 Sorbent Tube	Range Mean	0.1-156 4.0	Offices ($\mu\text{g}/\text{m}^3$) Restaurants ($\mu\text{g}/\text{m}^3$) [n=156] 0 - 49.7 [n=170] 0 - 23.8 5.1
Proctor (1989)	UK	Offices (10) Train Compartments 753 (20)	Varied Not Given	PASS UNIT w/140-4 Sorbent, 1 hr samples	Range A. Mean	0.6 - 26 8	Offices ($\mu\text{g}/\text{m}^3$) Offices (45) Train (5) Train (45) 0.1 - 2.1 0.1 - 19.3 0.1 - 11.2 4.5
Proctor, et al. (1989a)	UK	Betting Shops (8)	Not Given	PASS w/Tenax Sorbent	Smoking Non Smoking Outdoor	11 2 3	n Range ($\mu\text{g}/\text{m}^3$) 3 - 57 0.4 - 2 0.3 - 0.4 15.3 19.36 1.2 0.33
Proctor, et al. (1989b)	UK	Office (1)	205 lit/ person	Pump w/140-4 Sorbent	Smoking Non Smoking	Mean ($\mu\text{g}/\text{m}^3$) Median ($\mu\text{g}/\text{m}^3$) 0.6 3.1 0.6	

Table 3 Continued

Study	Country	Location	Ventilation	Airflow	Filter	Personal Pump	Notes	Mean Concentration ($\mu\text{g}/\text{m}^3$)	
								Office (n=12)	Background
Schroeder, et al. (1987)	USA	Office; Repair Shop, Outdoors	Not Given	Not Given	Filter (2 Days)	Personal Pump w/Sodium Bisulfate	2000 cfm	10.2 $\pm$ 2.2	3.0 $\pm$ 2.2
Sterling et al. (1988)	USA & Canada	Offices (12)	Not Given	Not Given	Not Given	Personal Pump	2000 cfm	3.0 $\pm$ 3.4	0.4 $\pm$ 0.1
Sterling & Mueller (1988)	Canada	Office (1)	Forced Air; Recirculation from (S) area	2000 cfm	Personal Pump w/AD-4 Sorbent, 2-0 hr samples	Personal Pump	2000 cfm	5.1 $\pm$ 1.4	0.14 $\pm$ 0.03
Thomas, et al. (1989)	USA	Industrial Cafeteria	8.0 ACH	300 m ³	14 days (11:30-1:30)	Pump w/AD-4 Sorbent	2000 cfm	2.1 $\pm$ 1.4	0.14 $\pm$ 0.03
Turner, et al. (1991)	USA	Offices (385)	Not Given	126 lit./person	Personal Pump w/AD-4 Sorbent, 1 hour samples	Personal Pump	2000 cfm	0.6	0.17
Vaughan & Hammond (1990)	USA	Office	Not Given	Not Given	Passive (n=1) & Active (n=1) on Sodium Bisulfate (liters)	Personal Pump	2000 cfm	0.6	0.17
					Snack Bar (n=3)	Personal Pump	2000 cfm	0.6	0.17
					Cafeteria (n=6)	Personal Pump	2000 cfm	0.6	0.17
					5 desks (n=6)	Personal Pump	2000 cfm	0.6	0.17
					Post Smoking Policy	Personal Pump	2000 cfm	0.6	0.17
					85.4 (designated smoking)	Personal Pump	2000 cfm	0.6	0.17
					3.3	Personal Pump	2000 cfm	0.6	0.17
					10.7	Personal Pump	2000 cfm	0.6	0.17

[illegible][illegible]

Table 4 (Continued)

Petreas, et al. (1988)	USA	Mobile Homes (312)	Not Given	Not Given	Palmer Tubes, 3 sites/House, one week samples	NO ₂ , ppb			
						Room	A	Mean	G
Spengler, et al. (1987)	USA	Home	Not Given	Not Given	Palmer Passive Sampler	Summer, all	311	20.2	15.2
						Bedroom	312	16.64	11.71
						Bedroom	312	16.64	11.71
						Gas	30	8.95	
						Kitchen	263	22.89	20.25
						Bedroom	265	15.99	13.51
						Outdoor	25	11.20	8.39
						elec.	47	6.95	6.16
						Kitchen	47	6.95	6.16
						Bedroom	48	11.77	5.44
						Outdoor	5	13.78	12.33
						Winter, all	254	26.56	21.09
						Kitchen	254	26.56	21.09
						Bedroom	254	18.67	15.10
Sterling, et al. (1983)	USA & Canada	Offices	Not Given	Not Given	Palmer Passive Sampler	Gas	230	28.68	24.33
						Kitchen	230	28.68	24.33
						Bedroom	230	19.98	16.77
						Outdoor	23	22.11	18.77
						elec.	23	6.39	5.16
						Bedroom	23	6.07	5.48
						Outdoor	4	23.74	21.32
						gas = gas stove			
						elec. = electric stove			
						Summer Kitchen LA	61	36.92	24.26
						Non-LA	250	19.26	15.66
						Bedroom LA	30	22.31	19.45
						Non-LA	32	15.27	12.51
						Kitchen LA	44	34.75	30.52
Tacon, (1982)	USA	Homes (9)	Not Given	Not Given	Palmer Tubes, 4 week Mean values (µg/m ³)	Non-LA	208	24.76	19.55
						Bedroom LA	48	25.74	21.26
						Non-LA	206	17.03	13.98
						LA = Los Angeles Basin			
						Non-LA = Not in LA			
						LA = Gas Home (ppb)			
						Mean	50		
						Fall	160	27.6	10
						Summer	162	25.2	6.6
						Winter	166	24.3	5.4
						Electric Home (ppb)			
						Mean	68	11.8	2.5
						Fall	160	27.6	10
						Summer	162	25.2	6.6
						Winter	166	24.3	5.4
Tacon, (1982)	USA	Homes (9)	Not Given	Not Given	Palmer Tubes, 4 week Mean values (µg/m ³)	Electric Home (ppb)			
						Mean	68	11.8	2.5
						Fall	160	27.6	10
						Summer	162	25.2	6.6
						Winter	166	24.3	5.4
						Electric Home (ppb)			
						Mean	68	11.8	2.5
						Fall	160	27.6	10
						Summer	162	25.2	6.6
						Winter	166	24.3	5.4
						Electric Home (ppb)			
						Mean	68	11.8	2.5
						Fall	160	27.6	10
						Summer	162	25.2	6.6
						Winter	166	24.3	5.4

Author & Date	Country	Building Type	Volume, m ³	Ventilation	Sampling	Passive Budget 2 samples/house 1 week/sample	Formaldehyde (ppm) Mean Median Range	Formaldehyde (ug/m ³) 1st-4th hr 2nd-4th hr	Formaldehyde (ug/m ³) 1st-4th hr 2nd-4th hr	Formaldehyde (ug/m ³) 1st-4th hr 2nd-4th hr
Dumont, (1986)	Canada	Homes (46)	Not Given	0.21 ach, ave.			0.091 0.091 0.03-0.74	25	25	25
Graham, et al. (1989)	USA	Office Building (52,000 sq ft.)	Not Given	Mechanical	Midnet Impingers chromatographic analysis, Formaldehyde		51 32 30 30 80	1st-4th hr 2nd-4th hr 1st-4th hr 2nd-4th hr 1st-4th hr 2nd-4th hr	25 30 30 30 80	25 30 30 30 80
Gron, et al. (1991)	USA	Office (1)	210 ft ² / Person	Not Given	Sodium Bisulfite Impregnated Filter			0.02-0.06 ppm		
Hedge, et al. (1990)	USA	Office Buildings (2)	Not Given	Not Given	PCA Method 10 11 3 hr samples		Mean formaldehyde (ppm) 0.023 0.023 0.019	SP-Smoking Prohibited SR-Smoking Restricted SB-Smoking Restricted		
Holowell and Hibsch (1981)	USA	Home (1) Office (1)	Not Given	0.4 ach	Not Given		Formaldehyde in new home Unoccupied, no furniture Unoccupied, with furniture Occupied, day Occupied, night Outside Unoccupied in an office building (89/92) Formaldehyde from various indoor environments Total Mobile homes w/ complaints Mobile homes w/ complaints Mobile homes w/ complaints Mobile homes w/ complaints Mobile homes w/ complaints	80-92 ppb 235-72 ppb 2615-102 ppb 140-312 ppb 420 ppb 49 ppb Mean (ppm) 0.1-0.8 0.1-1.77 0.3-0.44 0.3-0.4 0.4 0.80	1st Study 1 hr 2nd Study 4 hr (89/92) 89	
Lofgren, et al. (1989)	USA	Lavern	5-25 people 180 m ³	Not Given	Pump w/ sorbent 3 & 4 hr samples HPLC Analysis					

Table 5 Continued

Proslwa, et al. (1989)	Canada	Homes (20)	see results	Mul Given	Passive dustmeter One week	House type	Formaldehyde (ppm)			Vent. rate (ach)		
							H	Mean	Median	H	Mean	Median
						Mar 86	16	0.056	0.057	-	0.28	0.28
						Aug 86	16	0.040	0.072	16	0.30	0.29
						Oct 86	16	0.040	0.072	16	0.43	0.45
						Feb 87	16	0.054	0.061	16	0.43	0.45
						Total	54	0.054	0.061	37	0.35	0.36
						Conventional	4	0.079	0.077	4	0.16	0.44
						Mar 86	4	0.053	0.045	-	-	-
						Aug 86	4	0.090	0.086	4	0.15	0.17
						Oct 86	4	0.067	0.060	4	0.20	0.18
						Feb 87	4	0.067	0.060	4	0.20	0.18
						Total	15	0.074	0.066	12	0.17	0.17
						Smoking homes	15	0.074	0.066	12	0.17	0.17
						Non-smoking homes	39	0.055	0.063	-	-	-
						Evap.	0.058	0.068	0.063	-	-	-
						Building type						
						Single fam.	Yes	27	50	-	-	-
							No	37	32	-	-	-
						Total	32	102	-	-	-	-
						Mobile/trailer	Yes	36	6	-	-	-
							No	68	10	-	-	-
						Total	68	16	-	-	-	-
						Apt./Condo.	Yes	25	10	-	-	-
							No	25	24	-	-	-
						Total	47	29	-	-	-	-
						All types	Yes	27	42	-	-	-
							No	43	83	-	-	-
						Formaldehyde MO ₂ 1.9 ppm; 0.01, median						
						Formaldehyde (ppm)						
						Delta	H	Mean	Range			
						Clear Lake	27	0.07	0.03-0.15			
						Sunyside	14	0.10	0.06-0.18			
						Smoking (CIS/day)	H	Mean				
						<1	25	0.058				
						1-4	4	0.15				
						5-10	4	0.07				
						≥ 20	7	0.07				
						House						
						Formaldehyde (ug/m ³)						
						Indoor	42	126				
						Outdoor	49	412				
						Ratio	54-102					
						Formaldehyde (ppm)						
						Room	H	Ave.	Max.	Min.		
						Living room	30	0.090	0.261	0.000		
						Bedroom	45	0.088	0.235	0.000		
						Basement	49	0.092	0.265	0.000		

Table 6. Benzene measured under realistic conditions (ppb = $3 \mu\text{g}/\text{m}^3$)

Author & Date	Country	Building Type	Occupants	Ventilation	Sampling	Concentrations (Elements)	
						Smoking	Non Smoking
Bayer & Black (1987)	USA	Offices	Not Given	Mechanical	Personal Pump w/tenax, 4 hr samples (35, 345)	Benzene 2.0ppb	1.5ppb
Chen, et al. (1990)	Canada	Homes (12)	Not Given	Not Given	Iron/Charcoal 2 outdoor, 4 indoor samples each, 90 min. samples, 5-50 liters/sample	Frequency, Range, and Avg. ($\mu\text{g}/\text{m}^3$) Outdoor/Indoor 12 Homes Ambient Air (Feb/Mar) Benzene f Range Avg f Range Avg 12 1-13 7.3 12 5-59 14.6	Frequency, Range, and Avg. ($\mu\text{g}/\text{m}^3$) Outdoor/Indoor 6 Homes Ambient Air (Feb/Mar) Benzene f Range Avg f Range Avg 6 2-8 6.0 6 7-15 10.6
Grinan, et al. (1989)	USA	Office Building (52,000 ft ²)	Not Given	Mechanical	Pump w/tenax Sorbent, GC/MS	Pre-Bake-Out Concentrations ($\mu\text{g}/\text{m}^3$) 1st fl. 2nd fl. Plenum Roof 2.8 3 3 1 0.8 1.5 80 (80 = Below Detection)	Post-Bake-Out Concentrations ($\mu\text{g}/\text{m}^3$) 1st fl. 2nd fl. Plenum Roof 1.5 1.5 80 80
Lewis (1991)	USA	Homes (10)	Not Given	-2-8 ACH	55 Canister, 12 hr samples, GC/MS	Avg. Indoor Conc. from Outdoor Sources and Indoor Sources (ppbC) Compound Out 11 17 20 11 11 15 50 13 415 Benzene 1M 2 -1 2 1 0 1 -1 2 1	
Loftis, et al. (1989)	USA	Barren	5 - 25 people 180 m ³	Not Given	Stainless steel canister, GC/MS	First Study (hrC) Indoor Outdoor Benzene 27 6 21	Second Study (hrC) Indoor Outdoor ($\mu\text{g}/\text{m}^3$) Benzene 8 8
Pisil, et al. (1986)	USA	Homes (26)	Not Given	Not Given	Summa Canisters GC/FID, ECD	Summer Data 15 Samples Range f Obs. Mean Range f Obs. Mean Range 13 7.6 0.39-4.6 16 4.8 0.33-23.6 12 0.57 0.35-0.77	Outdoor Air (PPBV) Summer & Winter 6 Samples Each f Obs. Mean Range f Obs. Mean Range 13 7.6 0.39-4.6 16 4.8 0.33-23.6 12 0.57 0.35-0.77
Proctor (1989)	UK	Offices (10) Trains (20)	Not Given	Not Given	Pump w/tenax Sorbent, 1 hr. samples.	A. Mean Median Range A. Mean Median Range ($\mu\text{g}/\text{m}^3$) 6 3.1 0.6 - 26 11.6 0.9 - 28.6	11.6 0.9 - 28.6
					Benzene 12 Offices(US) 3 - 31 7.4 5.1 2.9 - 29.3	11.6 0.9 - 28.6	

receive would provide an independent assessment as to whether these health claims are realistic.

Dose: Dose is defined as the amount of a substance that actually enters the body. For airborne materials the dose is a function of the concentration of a substance, the duration of exposure, the rate of respiration, and the percentage of material potentially retained by the lungs.

Concentration: Concentrations of RSPs were determined as the mean difference between nonsmoking and smoking conditions as shown in Table 9.

Duration of exposure: In order to determine the duration of exposure in each of the five categories, data on time activity patterns were needed. Though there were several references available describing studies which performed time/activity surveys of one type or another, there were few that were adequate. The requirements that needed to be met included:

1. Data needed to be American or Canadian
2. Study needed to be of adults
3. Study could not be of select subpopulations
4. Study needed to include most of the entire day.

Five publications met the four chosen criteria (Jenkins et al. 1990; Juster and Stafford 1990; Shaw 1983; Spengler et al. 1985; Szalai et al. 1972). Each author's activity categories were allocated to one of the following locations that were chosen to match exposure categories used for the literature review.

Location	Exposure Category
1. Home, awake	Home
2. Home, asleep	Home
3. Work	Office, workplaces
4. Public Transportation	Public transportation
5. Restaurant	Restaurant
6. Bar	Bar/Taverns
7. Other, public	Office, workplaces (similar to office environment)
8. Outdoor	None

Time allocations for each category were then averaged to produce an average day based on the five studies reviewed. Time spent in each category is expressed separately for males, females, employed, and unemployed persons. Time spent in each activity category is expressed in minutes per day and hours per day averaged over seven days per week. If the average day did not add up to 1440 min (24 h), each category was adjusted by the percentage of the error to produce a 24-h day.

There were fewer data available regarding employed/unemployed time activity patterns than for male/female time activity patterns. Because of this, it was necessary to subdivide some authors' categories into more than one of the five chosen for

Table 9. Mean respirable particles $\mu\text{g}/\text{m}^3$ in smoking and nonsmoking areas in real-life situations.

Category	# of Studies	Smoking			Nonsmoking			Diff. in Means C = NS
		N	Mean	Range	N	Mean	Range	
Homes	14	951	49.5	17-212	905	22.3	7-77.1	27.2
Offices and Public Places	24	805	67.7	12-2700	640	45.9	nd-240	21.8
Restaurants	11	257	131.5	nd-685	335 ^a	89.7	c	41.8
Bars/Taverns	4	9	103.7	c	c	c	c	103.7 ^d
Trains	1	20	216	70.8-325	20	186	63.3-450	30

a - The mean is calculated by weighting the mean values in each study based on sample size and the calculating an overall arithmetic mean. If actual values for nonsmoking or smoking areas were not given, but UVPN values were available, the UVPN values were utilized in obtaining the weighted means. For example, if a total RSP mean value and UVPN mean value were available for a smoking area but not for a nonsmoking area, a nonsmoking area value was obtained by subtracting the UVPN value from the total RSP value.

b - Derived from total RSP-UVPN.

c - No ranges available; no data available.

d - Some of this RSP would be due to sources other than tobacco smoke. If properties are similar to restaurants, this mean would be approximately 48.3.

Table 10. Carbon monoxide concentrations (ppm) in smoking and nonsmoking areas in real-life situations. Conversion factor: 1ppm = 1.15 mg/m³.

Category	No. of Studies	Smoking			Nonsmoking			Diff. in Means
		N	Mean	Range	N	Mean	Range	
Offices and Public Bldgs.	13	697	2.35	0.1-8.7	275	2.99	0.7-4.0	-0.04
Restaurants	5	107	3.6	0.4-9.0	---	---	---	---
Taverns/Bars	2	5	6.4	---	---	---	---	---
Trains	2	18	2.2	1.0-5.2	10	1.30	0.5-2.9	0.90
Buses	1	35	6.0	3.7-10.2	---	---	---	---
Autos	1	---	---	---	213	11.6	0.8-22.3	---

Homes - Very little information on homes
 full et al. (1989); 76 homes, 0.7 mean, range 0-4.0
 No data on smoking or nonsmoking.

Table 11. Nicotine concentrations ($\mu\text{g}/\text{m}^3$) in smoking and nonsmoking areas in real-life situations.

Category	No. of Studies	Smoking			No. of Studies	Nonsmoking		
		N	Mean	Range		N	Mean	Range
Offices and Public Bldgs.	4	473	5.2	NO-69.7	5	270	0.3	0.1-2.1
Restaurants	10	390	5.7	0-37.2	---	---	---	---
Taverns/Bars Betting Shops	4	17	19.1	3-65.5	1	2	1.2	0.4-2.0
Homes	1	98	3.7	0.1-12.0	3	28	0.29	0-1.0
Trains	1	20	15.3	0.6-49.3	1	20	4.5	0.5-21.2

this review. To do this, the proportion determined from the male/female time activity pattern was used to divide that author's category. For example, time at home for employed and unemployed persons was determined by Spengler et al. (1985) but not divided into waking and sleeping time. The amount of time determined to be spent sleeping in the male/female time allocation was subtracted from Spengler's home time to produce home-awake and home-asleep values for employed/unemployed persons. The time activity patterns calculated from the literature are listed in Tables 12 and 13.

Respiration rates: Respiration rates were taken from Rosenblatt et al. (1982):

- 1) Adult male, light work—28.6 L/min (1.7 m³/h)
- 2) Adult male, resting—7.43 L/min (0.4 m³/h)
- 3) Adult female, light work—16.3 L/min (1.0 m³/h)
- 4) Adult female, resting—4.5 L/min (0.3 m³/h).

These figures assume 16 h of rest and 8 h of light work per day, and are in agreement with those from other sources (USEPA 1989).

An average of approximately eight hours per day is spent sleeping. This leaves eight waking hours per day spent at "light work" and eight hours spent "resting". Since no single activity period is likely to be all "light work" or all "resting", the two values were averaged to produce a respiration rate for "awake". These values are as follows:

- Male, awake—1.05 m³/h
- Male, asleep—0.4 m³/h
- Female, awake—0.65 m³/h
- Female, asleep—0.3 m³/h.

Retention efficiency: Retention efficiency for side-stream smoke particles has been reported by Hiller et al. (1982, 1987) to be 11%.

Results of dosimetric calculations

In any exposure situation, the retained dose may be calculated by the following equation:

Dose = Concentration $\times$ duration $\times$ respiration rate $\times$ % retention.

Concentration is the concentration of RSP measured in the various categories of exposure in Table 9.

Duration for that category is taken from the time/activity tables (Tables 12 and 13).

Respiration rates are calculated from Rosenblatt. The "home, asleep" category is given the resting respiration rate. All other categories are assigned the "awake" respiration rate.

Percent retention is 11% as calculated by Hiller.

Exposure to ETS can come in any number or combination of situations. To estimate the breadth of possible ETS exposures, doses of ETS have been calculated for four different scenarios:

1) Male and female—exposed at home, in restaurants, bars and other public places, but not at work or while traveling. This essentially calculates the ETS exposure one may expect during nonworking hours.

2) Male and female—exposed only at work and while traveling (assume all transportation by train). This will produce a conservative estimate of occupational exposures.

3) Worst case exposure, male and female—exposed at home and while traveling, works in a bar and is also exposed in other public places (assumes use of the average exposure values).

4) Employed vs. unemployed males—exposed in all facets of life, employed person works in office environment. Employed and unemployed females would be essentially the same but with different respiration rates.

The calculations for each are as follows:

1) Male and female—exposed at home, in restaurants, bars and other public places, but not at work or while traveling. Dose = (concentration; home $\times$ duration; awake $\times$ respiration rate; awake $\times$ retention) + (concentration; home $\times$ duration; asleep $\times$ respiration rate; asleep $\times$ retention) + (concentration; restaurant $\times$ duration $\times$ respiration rate $\times$ retention) + (concentration; bar $\times$ duration $\times$ respiration rate $\times$ retention) + (concentration; offices, $\times$ duration; other, public $\times$ respiration rate $\times$ retention).

Male Dose = $(27.2 \times 6.4 \times 1.05 \times 0.11) + (27.2 \times 7.5 \times 0.4 \times 0.11) + (41.8 \times 0.5 \times 1.05 \times 0.11) + (103.7 \times 0.8 \times 1.05 \times 0.11) + (21.8 \times 1.6 \times 1.05 \times 0.11)$

Male Dose = 45.11 μ g/day, 16.46 mg/y

Female Dose = $(27.2 \times 8.7 \times 0.65 \times 0.11) + (27.2 \times 7.8 \times 0.3 \times 0.11) + (41.8 \times 0.4 \times 0.65 \times 0.11) + (103.7 \times 0.9 \times 0.65 \times 0.11) + (21.8 \times 1.6 \times 0.65 \times 0.11)$

Female Dose = 34.28 μ g/day, 12.51 mg/y

2) Male and female—exposed only at work and while traveling.

Male Dose = 17.19 μ g/d, 6.27 mg/y

Female dose = 6.94 μ g/d, 2.53 mg/y

3) Maximum exposure, male and female—exposed at home and while traveling, works in a bar and is also exposed in other public places.

Male Dose = 108.65 μ g/d, 39.66 mg/y

Female Dose = 57.62 μ g/d, 21.03 mg/y

Table 12. Total time allocations for male/female.

Location	Males		Females	
	Min/day	Hr/day	Min/day	Hr/day
1. Home, awake	186	6.4	521	8.7
2. Home, Asleep	452	7.5	470	7.8
3. Work	296	4.9	167	2.8
4. Travel	61	1.4	67	1.2
5. Restaurant	11	0.5	26	0.4
6. Bar	48	0.8	54	0.9
7. Other, public	94	1.6	95	1.6
8. Outdoor	52	0.9	40	0.7
TOTAL	1,440	24.0	1,440	24.1*

* Totals do not add up to 24 hours due to rounding.

Table 13. Total time allocations, employed, and unemployed persons.

Location	Employed		Unemployed	
	Min/day	Hr/day	Min/day	Hr/day
1. Home, Awake	427	7.1	733	12.2
2. Home, Asleep	511	8.5	499	8.3
3. Work	276	4.6	5	0.1
4. Travel, Public	61	1.4	17	0.7
5. Restaurant	17	0.3	20	0.3
6. Bar	33	0.6	16	0.6
7. Other, Public	61	1.0	68	1.1
8. Outdoor	14	0.6	42	0.7
TOTAL	1,440	24.1*	1,440	24.0

* Totals do not add up to 24 hours due to rounding.

4) Employed vs. unemployed males—exposed in all facets of lifestyle, employed person works in office environment.

Employed Male Dose = 60.06 $\mu\text{g/d}$, 21.92 mg/y

Unemployed Male Dose = 62.34 $\mu\text{g/d}$, 22.76 mg/y .

There are several chemical and exposure pattern differences between direct smoking and ETS exposure. However, expressing ETS exposure in cigarette equivalents is one way to develop a sense of the magnitude of exposure.

Arundel et al. (1988) has calculated a retained dose of particles of 10.56 mg/cigarette and 8.48 mg/cigarette for male and female direct smokers, respectively. Using these figures, the dose in cigarette equivalents of particles for each of the four exposure scenarios becomes:

1) Exposed at home, in restaurants and in bars:

Male—1.56 cigarette equivalents per year

Female—1.48 cigarette equivalents per year.

2) Exposed at work and travel only:

Male—0.59 cigarette equivalents per year

Female—0.30 cigarette equivalents per year.

3) Maximum, works in a bar, exposed in all facets of life:

Male—3.76 cigarette equivalents per year

Female—2.48 cigarette equivalents per year.

4) Employed vs. unemployed males:

Employed—2.08 cigarette equivalents per year

Unemployed—2.15 cigarette equivalents per year.

Clearly, such calculations of cigarette equivalents have little or no relevance to any assessment of the potential risk from exposure to ETS. The mainstream smoke particles inhaled during the act of puffing on a cigarette will be quite different from ETS particles in terms of their precise chemical composition, their size distribution and the route in which they are taken into the body. However, the calculation of cigarette equivalents does at least allow a subjective impression of the relative doses involved in active smoking compared to everyday exposure to ETS.

DISCUSSION

Indoor air and ETS review

Respirable particulate matter: Table 9 shows the mean RSPs in smoking and nonsmoking areas in real life conditions. The mean differences between

nonsmoking and smoking conditions are 27.2 $\mu\text{g/m}^3$ for homes, 21.8 for offices and public facilities, 41.8 for restaurants, in excess of 48.3 for bars and taverns, and 30 for trains.

Carbon monoxide: Table 10 shows carbon monoxide concentrations (ppm) in smoking and nonsmoking areas in real life conditions. In offices, where the data allowed for a smoking/nonsmoking comparison, the mean difference was 0.28 $\mu\text{L/L}$ (0.32 mg/m^3). Because of the magnitude of this difference compared to the mean levels measured and ranges reported, the significance of this difference must be questioned. There are essentially no data since 1982 on nonsmoking conditions in restaurants or bars. The slightly higher levels in these areas indicate that smoking may account for at least part of the CO.

There is little information on CO in homes. Yuill and Comeau (1989) report on home CO, but they do not indicate whether smoking was present.

The information on CO levels in transportation vehicles indicates little difference between smoking and nonsmoking areas on trains. Buses have higher levels (6.0 $\mu\text{L/L}$; 6.9 mg/m^3) of CO; but from the information presented it is impossible to determine if the concentration is affected by tobacco smoke or by vehicle exhausts. The higher level of CO (11.6 $\mu\text{L/L}$; 13.3 mg/m^3) in autos where no smoking took place indicates that the impact is from vehicle exhausts (Flachsbart et al. 1987).

Nicotine: Table 11 shows nicotine concentrations in smoking and nonsmoking areas. Nicotine, as expected, is considerably lower in concentration in nonsmoking compared to smoking areas. The means of 6.2, 5.7 and 3.7 $\mu\text{g/m}^3$ for offices and public buildings, restaurants and homes, respectively, where smoking occurred, are extremely low exposures compared to the levels of many other volatile and semi-volatile substances found in indoor air. Smoking sections of trains are slightly higher and, as expected, bars and taverns exhibited the highest mean levels (19.1 $\mu\text{g/m}^3$).

Nitrogen dioxide: Most studies which measure nitrogen dioxide (NO_2) in the indoor environment evaluate the effect various appliances, such as gas stoves or kerosene heaters, have on NO_2 concentrations. Only three studies attempted to evaluate the impact of ETS on NO_2 levels in homes (Dumont 1986; Good et al. 1982; Hosein et al. 1985). Houses where smoking occurred had approximately 3.0 $\mu\text{g/m}^3$ higher nitrogen dioxide levels than houses with no smoking. There are no studies which evaluate the effect of ETS on NO_2 levels in offices, restaurants, bars, or transport vehicles.

Formaldehyde: There is a substantial amount of information regarding formaldehyde levels indoors. However, little of it evaluates the potential effect of ETS on formaldehyde levels. Of the literature reviewed, one study of 41 homes (Stock 1987) and one study of two office buildings (Hedge et al. 1990) compared formaldehyde levels to smoking status. The residential study found no increase in formaldehyde levels with increased levels of smoking. The office study found approximately a 10 nL/L ($12.3 \mu\text{g}/\text{m}^3$) increase in formaldehyde levels in a designated smoking area over a nonsmoking area of one building. However, there was no difference between the designated smoking area in one building and another nonsmoking building. Because of the limited number of samples and the number of confounding sources for formaldehyde these results must be interpreted with caution.

Benzene: Five studies contained benzene data in smoking and nonsmoking areas (see Table 6). In two of these studies, nonsmoking areas reportedly had higher concentrations of benzene. In three studies, nonsmoking areas had lower concentrations than smoking areas. The differences are minimal, especially when outdoor concentrations also are considered.

The assumption was made that in studies where smoking/nonsmoking was not reported by the author, that there was some smoking occurring. Where smoking is assumed to take place, the highest mean level recorded was $15.7 \mu\text{g}/\text{m}^3$. However, in nonsmoking areas the highest mean was 60.7. In summary, there are few data to support a conclusion that smoking has a significant impact on benzene concentration in offices.

The data on benzene in homes suggest that smoking homes have a higher concentration than nonsmoking homes by approximately $3.5 \mu\text{g}/\text{m}^3$. It is difficult to separate home-only data from personal exposure monitor data except for two studies where indoor air benzene ranges from 4.8 – $14.8 \mu\text{g}/\text{m}^3$. The one overnight study in homes by Wallace et al. (1987) shows an increase of approximately $3.1 \mu\text{g}/\text{m}^3$ in smoking homes vs. nonsmoking homes.

There are few data on benzene on public transportation. A paper by Proctor (1989) on 20 trains shows a slightly higher mean concentration of benzene in smoking versus nonsmoking areas. The mean differences are small.

Polyaromatic hydrocarbons (PAH's) and nitrosamines: PAH's are commonly found in indoor air. Except for naphthalene, quinoline, and isoquinoline, the levels measured are in the low ng/m^3 range (Table 8). Few

studies have compared PAH levels in smoking and nonsmoking environments. The two studies in this review which have compared smoking/nonsmoking areas indicate that between 50% and 80% of the concentration of various PAHs may come from tobacco smoke. Because of the paucity of data, this must be interpreted with caution. The presence of these substances has also been documented in wood smoke, automotive exhaust, foods, alcoholic beverages, and cosmetics (NTP 1989).

Two studies have reported the presence of N-nitrosodiethylamine (NDEA) and N-nitrosodimethylamine (NDMA) in smoke-filled rooms (Table 7). These are not tobacco-specific nitrosamines. The lack of reported background levels and the unusually high level of smoking prevents the evaluation of ETS contribution to these substances. Other nitrosamines reported to be found in tobacco smoke have either not been monitored or not been reported in ambient air where ETS is present.

The U.S. Surgeon General (1986) and NRC (1986) reports include summary tables of known or suspect human carcinogens present in concentrated sidestream and mainstream tobacco smoke. Concentrated sidestream and mainstream tobacco smoke are not representative of ambient air ETS because the concentrated smoke is subject to dilution in ambient air, removal by sinks or filtration, and possible transformation (Reasor 1987).

Based on current literature, it appears that ETS has an effect on the levels of nicotine and respirable particles in an indoor environment. There also is a slight increase in NO_x levels in the presence of ETS. ETS appears to have less effect on the levels of carbon monoxide, formaldehyde, or benzene.

Odor and irritation: Studies by Cain et al. (1987), Weber (1984), and Weber and Grandjean (1987) indicate that levels of ETS which produce carbon monoxide concentrations below 1.5 – $2.0 \mu\text{L}/\text{L}$ (1.7 – $2.3 \text{ mg}/\text{m}^3$) also will be acceptable to 80% or more of the occupants in terms of irritation, odor, and overall quality. Where a moderate amount of smoking occurs, this level is unlikely to be approached. This conclusion is reflected in ASHRAE Standard 62-1989 (ASHRAE 1989), which does not separate smoking and no-smoking areas in terms of recommended ventilation rates.

It is possible that the 1.5 – $2.0 \mu\text{L}/\text{L}$ (1.7 – $2.3 \text{ mg}/\text{m}^3$) level of carbon monoxide may be exceeded in some cases. This would occur either in heavy smoking situations, such as those found in bars or smoking lounges, or where inadequate ventilation occurs.

Dosimetric calculations

One can calculate the doses of RSP retained from ETS. This ranges from approximately 3 mg/y for a female exposed only at work to approximately 40 mg/y for a male exposed in all facets of his life. Occupational exposure is only a minor portion of total exposure in most cases. Exposures in one's private life may produce the largest retained dose of ETS particulates.

For exposures received while in transit, it was assumed that all transit time was spent in the smoking section of trains. Actual time allocation data (Jenkins et al. 1990) indicate that only 5% of travel time is spent on public transport. It is believed that when traveling by auto, nonsmokers will generally choose to travel with other nonsmokers. There are no data comparing particulate levels in autos where smoking occurs to levels where there is no smoking. However, carbon monoxide levels of 8.8-22.3 $\mu\text{L/L}$ (10.1-25.6 mg/m^3) found by Fluchsbart et al. (1987) suggest that exposures in automobiles come primarily from vehicle exhaust and not ETS. Thus, the choice of trains as a surrogate for ETS exposure while in transit is conservative.

The estimated mean RSP dose of exposure to the population of nonsmoking adults is based on the difference between smoking and nonsmoking environments. There is a possibility that a person could be exposed to the high end of the range of RSPs as reported in the literature. The likelihood is that the bulk of the RSPs in those situations would be from sources other than tobacco smoke.

Persons also may be exposed to the upper limits of ETS-derived RSP ranges. Generally, these are for short time intervals. The mean difference values for the various categories of exposure should reflect the overall minimum and maximum exposure such that the total dose for the year would be included.

Attempts to calculate increased risk or excess mortality from lung cancer (Repace 1985; NRC 1986) and heart disease (Wells 1988; Glantz and Parmley 1991) reportedly resulting from ETS exposure are not uncommon. These calculations, however, rely almost exclusively on epidemiologic studies that have no adequate measure of exposure or dose. Such studies are known to be subject to problems of bias (Lee 1987) and confounding factors (Koo et al. 1988) which have not been taken adequately into account.

One of the paradigms of toxicology is that the magnitude of the dose determines the response. Comparing the dose one may receive from ETS to the magnitude of claimed health effects provides one measure of the accuracy of those claims.

Other studies that have calculated ETS dosage (Arundel et al. 1988) have reported values similar to those calculated here. They also have found wide discrepancies between the level of risk calculated by the epidemiology studies and that which can be supported by dosimetric calculations. Wells (1991) and Repace and Lowrey (1991) have both attempted to address this discrepancy. Wells argues that the majority of the "tar" fraction of ETS may be in the vapor phase. He claims that this vapor phase would be retained 100%, producing the majority of the dose one would receive. Thus, he suggests that particles are not an accurate measure of ETS dose. However, the compounds he lists as candidates for vapor phase tar components are not convincing in terms of their potential human health effects. They also are substances that have only been measured in concentrated sidestream and mainstream smoke, not ambient ETS. Until levels of these compounds are actually shown to increase in the presence of ETS, his argument must be considered speculative.

Repace and Lowrey (1991) calculate a daily inhaled dose of ETS particles between 1.4 and 14 mg/d. Calculations based on literature values of ETS concentrations from this paper indicate an inhaled dose of between 0.1 and 0.06 mg/d. When one considers that only 11% of these particulates are retained, the actual dose becomes 0.01 to 0.006 mg/d or 1/140 to 1/233 of the dose claimed by Repace and Lowrey.

Until the problems of confounding and bias in the epidemiology studies are resolved, dosimetric considerations can be the only independent confirmation of the accuracy of their claims. At this point, it can only be concluded that the estimated dose of ETS one can be expected to receive does not support the health risk claims being made by USEPA (1990) and others.

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Mr. HOLCOMB. I think what is important about that paper is, I went back to all the scientific literature on indoor air in the last 12, 13 years, and that shows that the doses of exposure are very, very low. If you look at ASHRAE's indoor air quality procedures, they have looked at all of the situations that are included in H.R. 3434. It includes bowling alleys, it includes offices, it includes schools, it includes everywhere that people may enter or the public may enter.

At 15 cubic feet per minute per person, which is the minimum ventilation rate that is established by ASHRAE, the standard 6289, the dilution of tobacco smoke is so great, you can model it at 20 CFM at even greater dilution, you can show decidedly that the risk of people exposed to constituents under those situations is insignificant.

So the standard is there. It was available. It can be used today.

Mr. BLILEY. Thank you very much.

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Bliley.

Mr. Wyden?

Mr. WYDEN. Thank you, Mr. Chairman.

Mr. Whitley, you say in your testimony that the proposed smoking ban lacks scientific foundation. I just asked six Surgeons General if there was an overwhelming scientific basis for this legislation, and they all answered yes.

What would be your response to the Surgeons General?

Mr. WHITLEY. Well, I am not an epidemiologist, Mr. Wyden, and neither is any one of the six Surgeons General. They are essentially relying on conclusions that were stated in the Surgeon General's report of 1986 and the EPA risk assessments, which in turn were based on a number of studies, most of which fail to show any statistically significant correlation between environmental tobacco smoke and any disease. I will let Dr. Holcomb address that in more detail.

Mr. WYDEN. My time is short. I think that does fairly reflect your view that you disagree with the Surgeons General.

Do you think it is safe for children to be exposed to large amounts of environmental tobacco smoke, Mr. Whitley?

Mr. WHITLEY. There may well be a level at which exposure to environmental tobacco smoke and a number of other substances by children is unhealthy. And for that reason we advocate the approach of cleaning up the air generally instead of looking at source control.

And again, let me say that the only studies on this subject have been in residences and not in the public facilities described in this bill.

Mr. WYDEN. I guess I beg to differ with you. For example, the Environmental Protection Agency found in a typical restaurant that allows smoking—again, these are places visited by large numbers of our youngsters—particulate levels will violate the Federal health standard by 33 percent. That is directly contrary to what Mr. Holcomb said—

Mr. HOLCOMB. If indeed that is the statement, and I have just read it briefly before comment was made, it is absolutely untrue.

Let's separate fact from fiction. The standard that they quoted for an ambient air quality standard outdoors is 150 micrograms per cubic meter. The average in restaurants where smoking takes place is 40 micrograms per cubic meter or less. That is in my paper. I didn't pick just the studies that I wanted to. I took all the North American literature from 1982 on.

Mr. WYDEN. Mr. Chairman, just so the record reflects it, what I have given is almost a verbatim account of a memo done December 21st, 1993 by EPA. I would ask unanimous consent that be in the record.

Mr. WAXMAN. Without objection, that will be in the record.
[The memorandum follows:]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC., December 21, 1993.

Memorandum

Subject: Air Pollution From Smoking in a Restaurant

To: John Girman, Chief Analysis Branch LAD (6203J by FAX: 202:233-9555

From: Jim Repace, Exposure Assessment Methods Branch (6203 JW)

In response to Congressman Waxman's request, I have considered air pollution from smoking in a restaurant. The example is taken from a book chapter which appears in *Nicotine Addiction, Principles and Management*, T. Orleans & J. Slade, Eds, Oxford University Press, 1993; Chapter 7, Tobacco Smoke Pollution, by J.L. Repace (essential parts enclosed).

Under conditions of recommended ventilation rates and occupancy, a typical restaurant would have a background level of respirable particulate air pollution in the absence of smoking typically at 20 ug/m³. If 29 percent of the occupants smoked at the national average rate of 2 cigarettes per hour, however, the air pollution level would climb to a level of nearly 200 ug/m³ within a half hour, a level which is 4 times the EPA PM₁₀ standard of 50 ug/m³.

Mr. WYDEN. Let me, if I might, just ask one other question. That deals with the ventilation standard that you all favor, I gather, as a kind of alternative to Mr. Waxman's approach.

Now, the National Cancer Institute has done an analysis of it, and has indicated that a health-based ventilation standard that reduced cancer risks to the one-in-one-million standard commonly used by EPA would require ventilation rates above 5,000 cubic feet per minute. So what you all are advocating is a level of ventilation that is pretty close to having a gale force wind blown through an office.

Now, is that really the position of the tobacco industry, given that Mr. Whitley has even admitted that this could be a very serious problem for children?

Mr. HOLCOMB. I don't know that Mr. Whitley has admitted that it is.

Mr. WYDEN. Mr. Whitley—then do you want to answer that one again?

Mr. HOLCOMB. The dose makes the poison. If you have a very diluted material, whatever it is, at a high concentration, it can be a detriment to health—at a high concentration of anything. If it is diluted sufficiently, in this room, for instance, we probably get two to three parts per million of carbon monoxide, from a variety of sources, smoke from outside, smoke from cars coming inside.

Let me give you an example. In my written testimony, I have shown that there is a claim for all these cardiovascular deaths due to exposure to ETS. The experiments that were done that are referred to using animals used 100 to 150 parts per million of carbon

monoxide, compared to maybe one part per million that you get in natural exposure to environmental tobacco smoke. There is a threshold dose.

Mr. WYDEN. Let me ask a very specific question. Lilly Wyden is 4 years old. Is it safe for her to be exposed to large amounts of environmental tobacco smoke in buildings, Mr. Whitley?

Mr. WHITLEY. Certainly there would be a level above which it would not be environmentally sound to do that. The question is, is that level found in the kind of facilities that are outlawed in this bill, and I think the answer to that is no.

Mr. WYDEN. I am not sure how one would enforce such a ceiling other than to turn this over to the tobacco industry. And I gather ultimately that is what they advocate, is that we just have self-regulation, in spite of the fact that six Surgeons General have said that there is overwhelming scientific basis for this legislation to ban this smoking in buildings.

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you.

Mr. Synar?

Mr. SYNAR. Thank you.

Mr. Whitley, you say, "Everyone who has ever eaten in a restaurant, rolled a line in a bowling alley, or shopped in a mall knows that this condition cannot be guaranteed with certainty in any place where smokers and nonsmokers come together to relax and socialize."

Mr. Whitley, you are aware, I hope, that Atlanta's Hirshfield Airport has banned smoking but agreed to install smoking lounges. Guess who paid for those lounges? Phillip Morris. Doesn't that contradict your testimony that they won't pay to have separately ventilated facilities?

Mr. WHITLEY. I don't think Phillip Morris will pay for that all across the United States. I think they have done that on an experimental basis.

Mr. SYNAR. Would it be appropriate for the tobacco companies to have such a cost?

Mr. WHITLEY. It might if you justify the threat that is out there.

Mr. SYNAR. Do cigarettes kill people? Does smoking kill people?

Mr. WHITLEY. It has been established by epidemiological studies that active smoking has a significant statistical correlation with a number of diseases. And those diseases are in fact fatal.

Mr. SYNAR. Does smoking kill people, Dr. Holcomb?

Mr. HOLCOMB. If you will let me answer that question—

Mr. SYNAR. Just yes or no. Does smoking kill people?

Mr. HOLCOMB. I am not going to say yes or no.

Mr. SYNAR. OK.

Mr. Whitley, you said that the apartment association and I think the building association is on the take. Are you making that argument for the pediatricians, the AMA, the ear, throat and nose doctors, cancer specialists, surgeons? Are they all on the take?

Mr. WHITLEY. I didn't say anybody was on the take, Mr. Synar. I said it would be cheaper for smoking to be banned in public buildings than it would for the owners of those buildings to go to great expense to improve their ventilation and filtration system and clean up their air. I didn't say they were on the take.

Mr. SYNAR. But the point is they would do it for a profit motive. Do all these other people have a profit motive who are arguing for this kind of a ban?

Mr. WHITLEY. I am sorry.

Mr. SYNAR. Your argument is that the building and apartment people have a financial interest in the decisions they make. And I am asking whether the pediatricians, the AMA, cancer specialists and Surgeons General have a financial interest, or should their statements be taken in the context that they are trying to do what is good for public policy?

Mr. WHITLEY. I am not impugning any ulterior motives to the health professionals who have testified and expressed their opinions. I am simply saying it is cheaper and easier for public building owners if smoking is banned than it is for them to put in adequate filtration and clean up the air.

Mr. SYNAR. Mr. Holcomb, will you provide for this subcommittee the Holcomb Environmental Services' funding records and whether or not you have received funding from the Tobacco Institute or tobacco companies?

Mr. HOLCOMB. I can tell you now that I have consulted with the Tobacco Institute on several occasions. I will not provide, as I would not provide anyone, financial records. We work for a lot of different parties.

Mr. SYNAR. Have you received financial funding from tobacco companies?

Mr. HOLCOMB. I am here as a result of their requesting me——

Mr. SYNAR. And the Tobacco Institute also?

Mr. HOLCOMB. From the Tobacco Institute.

Mr. SYNAR. Yes.

Mr. Whitley, you argue we should leave these regulations up to State and local government. I find that interesting, since we left the restriction on cigarette sales to minors to State legislatures, and you all have done your darn level best to undo that legislation at the State-level.

How much money has the Tobacco Institute and industry and cigarette companies spent in lobbying, campaign contributions in State legislatures?

Mr. WHITLEY. I have no idea.

Mr. SYNAR. Will you provide that for the record?

Mr. WHITLEY. I suppose we can look at it.

Mr. SYNAR. Thank you very much.

Mr. WHITLEY. Let me comment on one thing, if I may, Mr. Synar. I wouldn't want to leave an incorrect impression. Our industry has not faulted the 18-year age limit for purchase of cigarettes at the level of State legislatures, but in fact we have actively supported it.

Mr. SYNAR. That is the most disingenuous statement you or your industry or the Tobacco Institute could ever make. You have systematically tried to undo not only the intent of this legislation, but you have purposely and deliberately misrepresented what the legislation is.

Now, I can bring in State officials on this, if you want to. But you have not been supporting the restriction of cigarette sales to minors. This was the greatest example in my legislative history of

Br'er Rabbit, where you all argued through some members on this committee that this was appropriate down at the State level, and then you have done your darn level best during your last year to dismantle that legislation.

Now, if you want to get into this, that is fine, but don't sit there and tell me you supported it when you have spent the better part of a year trying to dismantle it State by State.

Mr. WHITLEY. We haven't tried to dismantle an 18-year smoking age, Mr. Synar, 18-year smoking limit.

Mr. WAXMAN. Thank you, Mr. Synar.

Mr. Whitley and Dr. Holcomb, thank you very much for your presence.

Mr. HOLCOMB. Mr. Chairman, I would like to make sure that the full testimony is entered into the record.

Mr. WAXMAN. Thank you.

That concludes our hearing for today. We stand adjourned.

[Whereupon, at 12:05 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[The following statements were submitted for the record:]

STATEMENT OF LARRY HOLCOMB, PH.D.

**Holcomb Environmental Services
17375 Garfield Road
Olivet, MI 49017**

**HEARING ON H.R. 3434
"SMOKE-FREE ENVIRONMENT ACT OF 1993"**

February 7, 1994

My name is Larry Holcomb. I am an environmental toxicologist and vice-president of Holcomb Environmental Services, Olivet, Michigan. In the 1960's and 70's I was a professor at several colleges and universities where I performed research and taught courses largely to premedical students. From 1978 to 1986 I worked in the environmental protection programs for the Michigan Department of Natural Resources, then headed the Toxic Substance Control Commission for the State of Michigan. In those jobs my role was to evaluate potential toxic problems and help resolve them. From 1986 to the present I have worked for Holcomb Environmental. We evaluate exposure to chemicals in air, water or soil, determine whether there is significant risk to health and propose remedial measures.

The Tobacco Institute has asked me to review indoor air quality and the impact, if any, of environmental tobacco smoke (ETS). In particular, I have recently reviewed the EPA's Report on ETS and the published literature on effects of providing outdoor air ventilation in decreasing the concentration of materials in indoor air. I have also carefully evaluated H.R. 3434, the "Smoke-Free Environment Act of 1993." These views are my own and may or may not be shared by The Institute.

H.R. 3434 states that a ban on smoking in public places is necessary to protect children and adults from cancer, respiratory disease, heart disease and other claimed

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adverse effects of exposure to ETS. As I will explain, the published literature associated with indoor air quality and ETS exposure does not support that claim. My testimony will focus on two issues: the weaknesses of the EPA Report on ETS, and factors that affect indoor air quality.

Before evaluating the potential toxicity or carcinogenicity of any substance, including ETS, however, it is essential that one bear in mind that health problems based on exposure to a particular substance generally arise only when there is a dose threshold exceeded. In other words, "the dose makes the poison." Almost any substance may be toxic to health in sufficiently large quantities, while a small amount of the same material may have little, if any, adverse effect.

To understand why this is so important, one need only look at some of the studies that have been cited in support of the claim that ETS causes heart disease. Research on cardiovascular disease frequently has been done using concentrated sidestream smoke, not ETS, which is highly diluted. Levels of carbon monoxide in such studies therefore exceed 50 ppm and frequently 100 ppm. This is not at all representative of actual indoor exposure levels. In a recent article, I show that carbon monoxide is about 3 ppm in both nonsmoking and smoking offices and public buildings. My findings are consistent with those of other researchers. In most situations, carbon monoxide would not be more than 1-2 ppm higher whether or not ETS is present. This level is about 50-100 times less than the doses that are quoted by antismoking activists and have not been associated with any adverse cardiovascular outcomes.

I. EPA REPORT

The EPA Report is policy set forth as fact. EPA has distorted data, performed sloppy, poor science, ignored its own risk assessment guidelines and adjusted science to fit its own preconceived policy. I would like to set forth several points for your consideration.

A. The EPA Report is not a new study. It is a poor attempt to summarize the results of several studies.

B. EPA classification of ETS as a group A carcinogen does not justify a smoking ban. There are several group A carcinogens. They are all regulated using permissible exposure limits (PELs) and other standards. For example, benzene is something we all breathe on a regular basis, especially around gasoline stations. It is not banned but instead is regulated by an OSHA PEL. Vinyl chloride also is something we regularly inhale and is part of a new car odor. It also is the subject of an OSHA standard.

ETS does not yet have a standard in the United States. The World Health Organization (WHO) has a guideline of respirable particulates from ETS of 150 micrograms/cubic meter of air. If you look at the data in my 1993 article published in Environment International, you can observe that for homes, offices and public buildings, the WHO value would rarely be exceeded.

C. The EPA Report is based on an analysis of estimated exposure in the home, not in work or public places. Epidemiologic studies of workplace ETS exposure and lung cancer incidence fail to support an increased risk hypothesis. If the risk that EPA alleges was of the magnitude they claim, one would expect most of the workplace

ETS studies to reflect a statistically significant association. In fact, of the 14 studies that have examined workplace ETS exposure specifically, 12 report no statistically significant increase in risk for lung cancer in workers exposed to ETS compared to workers not exposed to ETS. The overall relative risk of all 14 studies combined is about 1.0, indicating no increased risk at all.

D. The EPA Report did not use exposure information on ETS in indoor air for calculation of risk, even though it was provided to them from several sources, including myself. In my article, I analyzed exposure to ETS in homes, workplaces and public places and calculated the dose of exposure based on concentration of ETS particulates, duration of exposure and percent retained. Depending on where persons spend their time, the estimated dose was equivalent to smoking between 0.3-3.5 cigarettes over a full year. That's not 3.5/day. That's 3.5 for the full year! This very small dose would not be expected to have any adverse impact on health.

E. The EPA process ignored new information. Data from the Brownson study would change the EPA statistics to show no significant risk of lung cancer associated with ETS exposure. The Brownson study, partially funded by the National Cancer Institute, was published in November, 1992. Although EPA knew about the study, the agency refused to include it in the final report.

F. The EPA used faulty statistics. In the 1990 first draft of the EPA Report, the agency used 95 percent confidence intervals for their conclusions. When they found that use of those confidence intervals would not make the case they wanted to present, they changed to 90 percent confidence intervals.

G. EPA did not review the animal data. EPA's own risk assessment guidelines require review of animal test data. There are several very good studies where animals have been exposed to sidestream smoke/ETS in the past few years. They all show that even at ETS concentrations far above reported values found in my 1993 report, lung cancers were not observed in exposed animals. EPA ignored this data.

H. EPA was politically rather than scientifically oriented in its evaluation of ETS. Why did EPA ignore proper scientific procedures and relax its own guidelines in classifying ETS as a Group A carcinogen? I believe they had their minds made up before they even began the evaluation. They manipulated the data and standard scientific procedures in order to fit their political agenda.

I. The EPA's conclusions about ETS and childhood respiratory effects are inaccurate. In addition to EPA's claim that ETS is a Group A carcinogen, the agency also asserted in its report that exposure to ETS is a cause of respiratory disease and symptoms in children. Although a statistical association has been reported between parental smoking and an increased incidence of respiratory symptoms and illness in children up to five years of age, the cause or causes of that association have not been established.

Many scientists have pointed out that the methodology employed by the childhood respiratory studies make them unreliable for a variety of reasons. In addition, numerous factors other than exposure to ETS may account for the weak association between parental smoking and impaired respiratory health in pre-school age children. A number of studies have reported, for example, a significant association between the respiratory health of children and parental respiratory health, household crowding, number of siblings and

attendance at day care facilities. Cross infection may well be the mechanism of such associations. Poor respiratory health also has been linked in a number of studies with low socioeconomic status, the strength of that association being much stronger than the association with parental smoking. Contrary to the claim made in the EPA Report, none of the studies of ETS and pre-school age children has yet controlled adequately for all potentially important confounding factors. That fact, among others, precludes the assignment of a causal role to ETS.

II. FACTORS THAT INFLUENCE INDOOR AIR QUALITY

Many diverse and complex factors affect indoor air quality, including temperature, humidity and the concentrations of various airborne substances. Such substances have a myriad of sources found both indoors and outdoors and their relative concentrations can be affected by a number of ventilation parameters.

A. Controlling Indoor Air Quality

The two primary factors affecting the concentration of various substances in an indoor environment are the strength of the sources and the ventilation rate. Elimination of a substance's source will most certainly lower the concentration. Generally, however, there is more than one source for a single substance and there may be many substances of potential concern. For this reason, source reduction generally is ineffective in substantially reducing the total constituent load. Alternatively, air quality may be addressed comprehensively by increasing ventilation rates, which reduces the levels of all substances of concern.

In a 1991 paper presented to the Air and Waste Management Association, we compared the effect of banning smoking with providing ventilation that meets the ASHRAE ventilation standard on 13 different substances in indoor air, many of which are found in ETS. We found that when smoking was banned, concentrations of the 13 substances, including respirable particulates and carbon monoxide, were reduced perhaps five percent overall compared with OSHA benchmark levels.

When ventilation was supplied in accordance with the ASHRAE standard, however, the concentrations of all 13 substances were reduced by approximately 65 percent. Therefore, eliminating smoking does not significantly reduce exposure to the substances found in ETS, while meeting ASHRAE's standard can significantly reduce all contaminants regardless of source.

Because H.R. 3434 would address only a minuscule portion of substances present in indoor air, it should be rejected in favor of a comprehensive solution based on compliance with the ASHRAE standard. Standard 62-89, "Ventilation for Acceptable Indoor Air Quality," prescribes the rate at which fresh or outside air must be delivered to occupied spaces and various means to condition that air. The standard recommends a ventilation rate of 20 cubic feet of fresh air per minute (cfm) per person for most commercial facilities, with 15 cfm as the minimum. The standard's drafters accurately concluded that a minimum ventilation rate of 15 cfm/occupant will produce indoor air that is of acceptable quality, assuming a moderate amount of smoking. For areas with more intense smoking activity (e.g., "smoking lounges"), the standard recommends a rate of 60

cfm/person. The standard also describes acceptable concentrations of various indoor contaminants, which is an alternative to the ventilation-based approach outlined above.

As a model for an IAQ standard, I would recommend the proposed Michigan Department of Public Health Occupational Health Standards Commission rule. I attach a copy of the draft for your review.

B. Costs and Benefits of Ventilation

Many employers, building owners and building managers are concerned about the costs of imposing ASHRAE 62-89 ventilation standards on existing buildings, many of which were designed in accordance with the lower ventilation rates of earlier standards. Actual energy and equipment change costs associated with applying ASHRAE 62-89 are minimal. To the extent that improved ventilation results in modest cost increases in some buildings (studies estimate about a five percent increase in energy costs), these costs may be more than offset by reduced absenteeism and improved productivity.

It is important to keep in mind also that the ASHRAE standard provides an alternative procedure to increasing ventilation rates. The "Indoor Air Quality Procedure" can be used to determine the relative concentrations of various substances of concern through periodic monitoring. If recommended levels are exceeded regularly, various mitigation strategies, including additional ventilation, should be considered.

For more information on the costs and benefits associated with complying with the ASHRAE standard, I have included references on this subject.

III. CONCLUSION

H.R. 3434 is not necessary to improve indoor air quality. Banning smoking will not improve overall indoor air quality. The best way to improve IAQ in public and workplaces is to require compliance with ASHRAE Standard 62-89. Ventilation decreases levels of substances in indoor air regardless of source. Compliance need not be costly, and improving ventilation and filtration may save money by reducing absenteeism and increasing productivity.

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STATEMENT BY THE AFL-CIO
EXECUTIVE COUNCIL ON
SMOKING AND THE WORKPLACE
FEBRUARY 19, 1986
BAL HARBOUR, FLORIDA

The 1985 Surgeon General's Report on The Health Consequences of Smoking — Cancer and Chronic Lung Disease in the Workplace — has focused new attention on smoking and occupational disease. The report purports to be a review of available scientific evidence on the combined risks of smoking and exposure to known occupational hazards. Rather than shedding light and contributing new information on the occupational health problems faced by many workers, the report minimizes the risks posed by workplace toxins. Broad conclusions are reached that smoking poses a greater risk to workers than their workplace environment, yet there is no evidence in the document to support these findings. The AFL-CIO believes that employers will attempt to use the report to shirk their responsibility to clean up the workplace and to place blame for occupational disease on workers who smoke.

The labor movement recognizes that smoking is a major public health problem of concern to both smokers and non-smokers and that there are real issues related to smoking and the workplace that should be addressed.

It is well documented that employers' failure to control exposures to toxic substances in the workplace increases the risk of diseases for many workers. For workers exposed to some of these hazards, such as asbestos, there is evidence that smoking may further increase the risk of certain diseases. Our first priority is to limit exposures to toxic substances to reduce the risk of all exposed workers. We support programs to provide medical surveillance, education and counseling about the risks of disease to workers at high risk.

Such programs should address the dangers of exposure to toxic substances and the added risk that may be posed by smoking, and provide assistance to those workers who wish to quit smoking. Many unions have already implemented these kinds of education and assistance programs.

We oppose employer discrimination against hiring of smokers and employer proposals to mandate the removal of smokers from certain jobs or to require participation in smoking cessation programs as an excuse not to meet their responsibility to clean up the workplace. Employers should not be allowed to shift the burden to individual workers.

Proposals to ban smoking in the workplace are also increasing. Unions are faced with legislation or unilaterally imposed employer policies that forbid smoking on the job and infringe on the rights of workers who smoke.

Unions have a legal responsibility to represent the interests of all their members — smokers and non-smokers. The AFL-CIO believes that issues related to smoking on the job can best be worked out voluntarily in individual workplaces between labor and management in a manner that protects the interests and rights of all workers and not by legislative mandate.

The AFL-CIO is committed to improving the working conditions and health of all our members. We urge our affiliated unions to continue their efforts to reduce workplace hazards and to provide voluntary assistance and education to workers who smoke as part of ongoing comprehensive programs to improve the health of union members.



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FRANK HURT
INTERNATIONAL PRESIDENT

STATEMENT ON
H.R. 3434
BAKERY, CONFECTIONERY & TOBACCO WORKERS
INTERNATIONAL UNION, AFL-CIO

SUBMITTED FOR THE RECORD
TO THE
HEALTH AND ENVIRONMENT SUBCOMMITTEE
OF THE
HOUSE ENERGY AND COMMERCE COMMITTEE

FEBRUARY 7, 1994

The Bakery, Confectionery & Tobacco Workers International Union (BC&T) appreciates this opportunity to submit for the formal record our perspective on H.R. 3434, the "Smoke-Free Environment Act of 1993."

Our union, headquartered in Kensington, Maryland, represents approximately 16,000 hard-working men and women employed in the tobacco industry in the United States.

Before providing specific comments on the legislation, we would like to refer the Subcommittee to the national AFL-CIO's position on the subject of smoking in the workplace, which we have included as part of our formal submission for the record.

The AFL-CIO opposes the imposition of smoking restrictions by either legislative or administrative mandate. Rather, organized labor believes that smoking policies are best developed within the context of individual worksites when they include discussion and negotiation between employers and employees or their elected employee representatives. The BC&T endorses this approach.

While BC&T could support the concept of designated smoking areas included within H.R. 3434, we cannot support the bill in its entirety because of several concerns which we discuss below.

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 Health & Environment Subcommittee
 House Energy and Commerce Committee

1. H.R. 3434 does not adequately address the real problems in indoor workplaces. Through its sole focus on banning environmental tobacco smoke (ETS), H.R. 3434 moves ETS ahead of a host of indoor air contaminants which exist in the workplace and have been proven far more hazardous to workers and the general public. It is regrettable that legislation to ensure worker health and safety and reduce exposure to such contaminants is not pursued as vigorously as H.R. 3434.
2. Enactment of an ETS-only ban will effectively pre-empt comprehensive IAQ legislation. Because H.R. 3434 is high-profile, highly controversial legislation which ignores the broader, more comprehensive issue of workplace protection, debate and passage of H.R. 3434 may have a chilling affect on the political resources within Congress and federal agencies to further legislate or regulate needed standards in the area of worker health and safety.
3. Subsection (c), which refers to "specially designated smoking areas" is too vague and fails to provide the Administrator of the Environmental Protection Agency with necessary guidance. The writings on building ventilation by EPA staff indicate a serious lack of expertise on the subject. Without more specific guidance from Congress, EPA's regulations for designated smoking areas will, most likely, reflect the biases of agency staff rather than sound ventilation engineering principles.
4. Moreover, H.R. 3434 as drafted would certainly apply to workplaces which have traditionally been under the jurisdiction of the Occupational Safety and Health Administration (OSHA). This bill would create confusing and even conflicting roles for the two agencies. We believe that the indoor air environment in the workplace is a subject that should remain within the jurisdiction of OSHA.
5. H.R. 3434 establishes a permissible exposure level (PEL) for ETS of zero, while Congress, EPA and OSHA tolerate far higher PEL's for substances whose lethal effects at the permitted exposure level are far better established. We believe that Congress should take a reasoned, balanced approach to legislation which will regulate virtually every indoor space in the U.S. and not be swept up in the carefully orchestrated hysteria surrounding the issue of environmental tobacco smoke.

Based on the above concerns, we respectfully urge the members of the Health and Environment Subcommittee to reconsider H.R. 3434.

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James T. Golden, Administrator

**Statement of the
National Energy Management Institute
Submitted to the
Subcommittee on Health and the Environment of the
House Energy and Commerce Committee
Concerning
Legislation to Restrict Smoking in Public Places
February 7, 1994**

The National Energy Management Institute (NEMI) is a national, non-profit labor/management trust of the sheet metal industry with offices in 11 cities across the country.

Over the past several years, NEMI has been actively involved on the national, state and local levels in the identification of practical solutions to indoor air quality problems. During this time, NEMI has investigated scores of buildings and has come to the conclusion that the primary cause of worker indoor air quality complaints focuses on ventilation deficiencies.

The Energy Management and Indoor Air Quality Professionals

In most buildings we have investigated, the best solution to the complaints and/or health problems is usually not focusing on a single source, but involves the proper design, installation, operation and maintenance of the ventilation system -- whether smoking is permitted or banned.

Our conclusion has been affirmed by the findings of the National Institute of Occupational Safety and Health (NIOSH) which also found that the majority of indoor air quality complaints stem from the inadequate operation, maintenance or design of ventilation systems.

NEMI understands that while environmental tobacco smoke is the only visible indoor air constituent, making it an easy target for legislative action such as H.R.3434, NIOSH finds that environmental tobacco smoke makes up only 2 percent of indoor air constituents.

Our concern is that the broader issue of comprehensive indoor air quality legislation is being ignored. Based on our practical experience, NEMI believes Americans would be better served by enacting legislation that calls for a comprehensive answer to all indoor airborne constituents and one that relies on effective ventilation system design, installation, operation and maintenance.

For example, NEMI recently worked with the American Federation of Government Employees in the Social Security Administration building in Richmond, California, where

smoking has been banned for many years. We became involved after a lethal outbreak of Legionnaire's disease in 1991 killed two people and rendered several others severely ill due to exposure to the Legionnella bacteria -- a deadly, invisible airborne agent -- attributed to lax maintenance practices. This and other similar experiences have led us to conclude that in banning smoking alone we often neglect the larger comprehensive problems of poor indoor air quality.

In 1986, the California Occupational Safety and Health Standards Board adopted a requirement that ventilation systems be maintained and operated to provide at least the original volume of outside air required by their state building code, in effect at the time the building permit was issued. In addition, the CAL-OSHA ruling requires that the ventilation system be continuously operated during the facility's normal working hours and requires an annual inspection of the heating, ventilation and air conditioning system with written documentation of the findings. NEMI believes that this type of regulatory activity should be the basis for truly effective national indoor air quality legislation.

It should also be noted that the federal Occupational Safety and Health Administration (OSHA) published a Request for Information in 1991 on the indoor air quality issue and received more than 1,200 submissions. Many of these were in support of comprehensive solutions rather than contaminant-by-contaminant bans. OSHA has stated that it will come forward with a directive based on this material, and this ruling could provide Americans with

comprehensive indoor air quality protection. NEMI hopes that this body will direct attention to this federal rule-making process.

In addition, NEMI works with many labor unions across the country. Many in the labor community agree with the AFL-CIO resolution that suggests that these types of issues should remain within collective bargaining guidelines. Management and labor have successfully worked through this issue in the past, and we have every confidence that they can continue to do so in the future.

NEMI is looking forward to working with the Subcommittee on Health and Environment in developing legislation that will address effective ventilation strategies that result in improved air quality for all Americans.

Thank you.



ENVIRONMENTAL TOBACCO SMOKE

THURSDAY, MARCH 17, 1994

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2253, Rayburn House Office Building, Hon. Henry A. Waxman (chairman) presiding.

Mr. WAXMAN. I welcome all of you to our subcommittee today. I apologize for the room. This is not the usual room our committee meets in. Our usual room is larger. Now it is being occupied by another subcommittee. I hope you all heard me.

Well, I want to welcome you to our hearing. This is our second hearing on the Smoke-Free Environment Act of 1993, or H.R. 3434. The issue of regulating tobacco—environmental tobacco smoke has received an enormous amount of attention in the past few months. We have seen major chain restaurants such as McDonald's and others announce smoke-free policies in their establishments. Our Nation's largest employer, the Defense Department, announced last week that it, too, was going to go smoke-free. We know the health effects of exposure to environmental tobacco smoke, and we know that this legislation will save our country billions of dollars in reduced health care costs, lost earnings and building maintenance expenses. More importantly, the public is asking for this legislation.

We all receive a great deal of mail on the major issues before the Congress, and much of this is computer-generated, postcards and form letters on this issue. However, real people are writing real and heartfelt letters. I have heard from a grandmother in Ohio, a blackjack dealer in Nevada and the father of an asthmatic child in Tennessee.

This issue cuts across ideological lines and political lines as well. In fact, I wanted to share a letter I received from Ronald K. Leon, who describes himself as a Rush Limbaugh-loving, staunch conservative. Mr. Leon's letter reads: "Usually I am against almost all Government intrusions in the life of the American people. However I am going to give you 110 percent of my support for your goal of a smoke-free society, because I do not consider this an intrusion. Quite the contrary. The Government puts controls on auto and factory pollution and none on tobacco pollution. Sir, I am nauseated by the foul stench of tobacco smoke. I am sick to death of going to a restaurant and having my meal ruined by—because I am choking on smoke. I am tired of going to a shopping mall and having to wade through clouds of smoke. I would love to be able to go to a

nice country western nightclub and listen to a good band, but I cannot because the smoke sickens me and the bars are full of it. So, as you can see, I am literally deprived of many enjoyments and even some freedoms because smokers continually feel that they have the right to pollute my air space. They have no right, either real or perceived to do so. I have the right to breath clean air without being poisoned. Seventy-eight percent of us do not smoke and we are under siege by this small minority, not to mention the tremendous health care costs this habit must surely incur. Keep going, Congressman, do not stop. I want to enjoy life without gagging whenever I go out. If there is anything this completely average American can do, do not hesitate to write or call. I have never voted for a democrat in my 31 years of life, but I would vote for you in a heartbeat."

Well, I thank Mr. Leon. I wished he lived in my district, but he does not. I am grateful for his support, and I am even more grateful that he took the time to share his perspective with us. This morning we are going to hear the perspective of children who may be the group most affected by environmental tobacco smoke. I want to welcome Lauren Minor, Megan Udell and Jason Emmons for being with us today. They are going to talk about why they think this legislation is important.

The cigarette companies may not like this bill, but, Lauren, Megan and Jason will make it absolutely clear why we must pass H.R. 3434 this year. It is good for our children and it is good for us.

Before calling on them, I want to recognize Mr. Bliley, the ranking Republican member of this subcommittee for any comments he wishes to make.

Mr. BLILEY. Thank you, Mr. Chairman. This is the subcommittee's second hearing on H.R. 3434, the Smoke-Free Environment Act of 1993. Mr. Chairman, I appreciate your willingness to hold a second hearing and to include some witnesses at my request. Because this bill is one of the most extreme anti-smoking bill ever considered at any level of Government anywhere in the country, it demands some very careful scrutiny.

I think what we will find at the end of the day is that this legislation is a solution in search of a problem. Anyone who reads the newspaper or listens to the nightly news is aware that private companies, State and local governments, and even Federal agencies are taking steps to accommodate the concerns of their employees and constituents when it comes to environmental tobacco smoke. How many companies and State and local governments have acted to adopt restrictions on smoking? The answer is literally thousands. As we meet today, smoking restriction measures have been adopted by 48 States and literally thousands of local governments.

In addition, as we will hear from some of our private sector witnesses this morning, an overwhelming number of companies have adopted smoking restrictions. According to the most recent comprehensive survey of workplace smoking policies conducted by the Bureau of National Affairs and the Society for Human Resource Management, 85 percent of the private employers who responded to the survey have workplace smoking policies. Forty percent of those employers have implemented total smoking bans and an ad-

ditional 34 percent prohibit smoking in all work areas. I think it is important to point out that this survey is now several years old, and so the number of companies with smoking policies is even larger than the 85 percent reported by the survey.

With the voluntary actions taken by large numbers of employees, employers and governments, why is H.R. 3434 necessary? I think it is because the proponents of this legislation are not satisfied to allow companies and other local entities to work out an accommodation between smokers and nonsmokers. What the proponents of this legislation want is a ban on smoking outright. This legislation purports to allow smoking in certain places. It establishes nearly insurmountable obstacles in the way of actually providing such a place. First, the bill says a smoking area must be directly exhausted to the outside. Second, it says the smoking area must be in a place that nonsmokers are never required to enter. Regardless of the cost of creating a smoking area, exhausted separately to the outside, it is hard for me to imagine an area in any public building that a non-smoking individual might not ever have to enter.

I hope it becomes clear today that H.R. 3434 is a very radical proposal, and that it is based on the very radical idea that no amount of environmental smoke is safe. In our first hearing on the bill, I raised my concerns with the scientific underpinnings of EPA's risk assessment on ETS. So, I will not go into that issue again at this time. However, I do feel compelled to note that within the past several days, the Congressional Research Service has completed a report entitled "Cigarette Taxes to Fund Health Care Reform and Economic Analysis."

While I do not agree with every word of the CRS report, I want to draw the subcommittee's attention to CRS's review of EPA's risk assessment. CRS noted, among other things, that, in conducting its risk assessment on ETS, EPA departed from otherwise applicable standards in judging ETS, after finding that ETS could not be declared to be harmful without such a departure. The CRS report noted, with a touch of understatement, I think: "It is unusual to return to a study after the fact, lower the required significance level, and declare its results to be supportive, rather than unsupportive of the effects one's theory suggests should be present."

I would like to ask unanimous consent, Mr. Chairman, that the complete text of CRS's review of EPA's risk assessment be included in the record.

Mr. WAXMAN. Without objection, that will be so ordered.

Mr. BLILEY. Thank you, Mr. Chairman. I think we need to take a comprehensive look at the problem of indoor air quality. I will be interested to hear from some of our witnesses this morning how many indoor air problems are the result of cigarette smoking and how many are the result of other problems. I am aware that some office buildings continue to have very serious indoor air quality problems even after smoking is banned. To address just one possible source of indoor air contamination and in a way that is neither rational nor effective, is not serving the public's interest.

Thank you, Mr. Chairman. I look forward to the testimony of the witnesses.

[The CRS report follows:]

CRS Report for Congress

Cigarette Taxes to Fund Health Care Reform: An Economic Analysis

Jane G. Gravelle
Senior Specialist in Economic Policy
Office of Senior Specialists

and

Dennis Zimmerman
Specialist in Public Finance
Economics Division

March 8, 1994



APPENDIX A: EVIDENCE ON PASSIVE SMOKING EFFECTS

The Manning study data do not indicate much of an effect of increased health costs from passive smoking. These data are used to calculate the health care costs of active smoking, but not passive smoking.⁶⁰

The claim that passive smoking results in damage to the health of nonsmokers is based upon both theory and empirical analysis. In this view, the theoretical case for the existence of passive-smoking effects is considered to be sound and leads investigators to expect to find empirical support for the proposition.

This theoretical case that passive smoking imposes external costs on nonsmokers can be summarized in three steps: (1) environmental tobacco smoke has the same components as smoke inhaled by smokers; (2) there is physical evidence of some absorption of these components; and (3) a positive relationship exists between active smoking and additional disease and health costs.

Questions have been raised about this entire chain of reasoning, but the focus here is the third link in the chain. This link is based upon evidence on active smokers who report different amounts of smoking. Even the lightest smokers among active smokers, however, experience far greater exposure to and absorption of disease-causing agents than do passive smokers. Such evidence on active smokers is necessary but not sufficient to conclude that a similar relationship exists for passive smokers. It is entirely plausible that the (unknown) health effects/physical damage function rises very little over the range of exposure levels for passive smokers and begins to rise rapidly as the physical damage levels experienced by active smokers are approached.

The existence of an exposure threshold for disease onset below which many passive smokers fall is not implausible. Most organisms have the capacity to cleanse themselves of some level of contaminants. It is for this reason that public policy usually does not insist that every unit of air or water pollution be removed from the environment; the damage of low levels of pollutants is sufficiently small (through the self-cleansing process) that removal is not cost effective. In fact, strongly nonlinear relationships in which health effects rise with the square of exposure, and more, have been found with respect to active smoking (see Surgeon General's Report, 1989, p. 44). Were these relationships projected backward to construct the lower (unknown) portion of the health effects/physical damage function, the observed relationship might lead researchers *a priori* to expect no empirical relationship. Thus, the issue raised by this potential break in the causative chain is whether researchers should expect to find a significant relationship between passive smoking and health effects.

⁶⁰ The Manning study uses other data to make some calculations on the cost of cancer deaths from passive-smoking. The details of these calculations are unclear and the results appear to be inconsistent with the remainder of the study.

A number of epidemiological studies have assessed the effects of environmental tobacco smoke on specific diseases, with the largest body of research focusing on lung cancer among nonsmoking wives of smokers. There have also been a number of studies on heart disease in spouses of smokers and general respiratory illnesses in children. Based upon these studies, several Government agencies have, in the last few years, taken the position that environmental tobacco smoke causes health hazards, including the Office of the Surgeon General and the Environmental Protection Agency (EPA).⁶¹ These hazards include lung cancer risks in nonsmoking adults and respiratory effects in children. EPA issued a risk assessment in 1992 that classifies environmental tobacco smoke as a cancer-causing agent.

The positions taken on passive smoking's effects on health by Government agencies and by the EPA 1992 assessment in particular have been subject to criticism by the tobacco industry and by some researchers.⁶² The following discussion of the lung cancer effect draws on the evidence presented on both sides of the passive smoking issue with regard to the statistical and scientific evidence.⁶³

First, critics have questioned how a passive smoking effect can be discerned from a group of 30 studies of which six found a statistically significant (but

⁶¹ U.S. Department of Health and Human Services, *The Health Consequences of Involuntary Smoking*, 1986, Surgeon General Report, DHHS Publication Number (CDC) 87-8398; and United States Environmental Protection Agency (1992).

⁶² A group of tobacco growers and manufacturers has filed a lawsuit challenging the EPA assessment as not being supported by the evidence. Among the issues raised is the use of empirical work based upon exposure in the home to draw inferences about health effects from exposure in the workplace.

⁶³ These sources include the U.S. Department of Health and Human Services, Surgeon General Reports for 1986 and 1989; United States Environmental Protection Agency (1992), which detail the rationales for their positions. These reports also summarize the epidemiological studies on environmental tobacco smoke, especially on lung cancer and childhood respiratory illness. The reader is also referred to a hearing at which researchers who both supported and criticized the EPA study appeared: U.S. Congress, House Committee on Agriculture Subcommittee on Specialty Crops and Natural Resources, *Review of the U.S. Environmental Protection Agency's Tobacco and Smoke Study*, 103rd Congress, 1st Session, July 1993. For a view that questions the passive-smoking hazard, focusing particularly on lung cancer, and that is written for the layman, see Gary L. Huber, Robert E. Brockie and Vijay Mahajan, "Passive Smoking: How Great a Hazard?" *Consumers' Research*, July 1991, 10-15, 33-34. Huber, et al. also wrote a companion paper on cardiovascular disease "Passive Smoking and Your Heart," *Consumers' Research*, April 1992, pp. 13-19, 33-34. Finally, see Kyle Steenland, "Passive Smoking and the Risk of Heart Disease," *Journal of the American Medical Association*, January 1, 1992, Vol. 267, pp. 94-99. These last two articles provide capsule summaries of epidemiological studies on passive smoking and heart disease. Finally, see The Tobacco Institute, *EPA Report Scientifically Deficient* for a summary of the industry's criticism of the EPA report. Some critics of the claim that passive smoking causes disease have also raised questions about institutional bias in the Government or in the professional journals; those issues are not addressed here.

small) effect, 24 found no statistically significant effect, and six of the 24 found a passive smoking effect opposite to the expected relationship.⁶⁴

EPA attempted to standardize this diverse group of studies to account for statistically important differences in their methodologies. One important difference in the studies is the chance they accepted the absence of a passive-smoking effect when in fact a passive-smoking effect existed. The smaller the size of the sample (number of observations, or people, for whom data was available), the greater the chance of making such a mistake. To correct for these differences, EPA adjusted (weighted) the estimate of passive-smoking effect in each study.⁶⁵ This has the effect of reducing the importance of studies with small sample size, studies that would tend to find less significant effects for passive smoking, and increasing the relative importance of studies with large sample size, studies that would tend to find more significant effects for passive smoking.

EPA adjusted the results of each study for misclassification bias (classifying smokers or former smokers as never-smokers). It also made subjective judgments about the extent to which the studies suffered from a variety of other statistical problems, such as confounding (failure to consider the influence of other factors that might increase risk). Those that fared poorly in this analysis were placed in a "Tier 4" category and excluded from the analysis of joint significance of the studies. This procedure allowed EPA to "emphasize those studies thought to provide better data...". (EPA, p. 5-61). After making all these adjustments, EPA combined the studies to conclude that, as a group, the remaining studies indicate existence of a passive-smoking effect.

Another test the EPA conducted was to examine the included studies for evidence of a positive relationship, within each study, between risk and degree of exposure (e.g. number of years smoked). They found such a relationship in 10 of the 14 studies for which such data were available. They also found that the highest-exposure-level group had higher risks than other groups combined, which was statistically significant in 9 of 16 comparisons.

One thing EPA did in its assessment is change the standard for statistical significance from the usual standard, and the one generally used in the original studies. Admittedly, it is unusual to return to a study after the fact, lower the required significance level, and declare its results to be supportive rather than unsupportive of the effect one's theory suggests should be present.

⁶⁴ In this context, if 50 to 100 out of 1,000 active smokers will die of lung cancer, 1 to 2 out of 1,000 passive smokers will die of lung cancer. This is based upon EPA's estimates of lung cancer deaths from passive smoking divided by the total lung cancer deaths attributable to active smoking, plus Viscusi's reported estimates of the lifetime risk of lung cancer deaths from active smoking.

⁶⁵ The weight is the reciprocal of the study's passive-smoking effect variance divided by the sum of the weights for all studies, times 100.

However, this characterization masks the critical issue raised by the change in the statistical significance standard. The test of statistical significance used in these studies answers the following question: How large a chance, statistically speaking, are we willing to take that we accept existence of a passive-smoking effect when in fact a passive-smoking effect does not exist? In effect, EPA changed the standard from accepting a chance of two-and-a-half percent to accepting a chance of five percent. The policy implication of this change is that there will be a greater chance of focusing resources on an inappropriate intervention (from an efficiency standpoint).

A few other issues are worthy of mention. These studies do not have (and indeed cannot have) very precise estimates of exposure from environmental tobacco smoke. The data are based on interviews of the subjects or their relatives. If errors in measurement occur in a systematic way that is correlated with development of the disease, the effect would be to bias the results. An example would be if those individuals who developed lung cancer (or relatives of those individuals) remembered or perceived their exposure differently from those who did not develop the disease.

Another concern is the possibility that some nonsmokers are actually current or former smokers and that such current or former smokers are more likely to be married to husbands that smoke. While EPA made some adjustment for this effect, it is not possible to correct precisely for this problem. That is, it remains possible that a relationship observed might reflect the effects of active rather than passive smoking.

In addition, while EPA considered the presence of confounding factors in its evaluation of the studies, this issue is not laid to rest. If wives of smokers share in poor health habits or other factors that could contribute to illness and that are not or cannot be controlled for, statistical associations found between disease and passive smoking could be incidental or misleading. This effect could presumably be correlated with exposure levels.

These limitations of studies are often inevitable, but they impart some degree of uncertainty to the results, especially when relatively small risks are estimated.

Two epidemiology studies that each covered a large number of observations were published in 1992 after the cutoff date for inclusion in the EPA report. The one with the largest number of observations found no overall increased risk of lung cancer among nonsmoking spouses of smokers,⁶⁶ the other found an

⁶⁶ Ross C. Brownson, Michael C. R. Alavanja, Edward T. Hock, and Timothy S. Loy, "Passive Smoking and Lung Cancer in Women," *American Journal of Public Health*, November 1992, vol. 82, pp. 1525-1529.

increased, but statistically not significant, lung cancer risk.⁶⁷ Both studies looked at exposure levels within their samples and both found a statistically significant increased risk among the highest exposure group in some categories. In smaller exposure groups, the first study found an unexpected relationship (a negative relationship between passive smoking and disease) and the second found a positive, but not a statistically significant, relationship. It has been pointed out that in large studies where the data are broken into several subsets and each is analyzed separately, some associations may be statistically significant as a matter of chance.

Many of the statistical concerns raised above with regard to lung cancer are relevant to respiratory effects in children and heart disease in adults. Indeed, the conclusions by these Government agencies about passive smoking and disease are generally not extended to heart disease. The presence of other factors that may be related to these illnesses that are not controlled for are particularly important in the case of heart disease and general respiratory illness, where the link between active smoking and the disease is not as powerful as in the case of lung cancer. To restate this criticism, if wives or children of smokers share in poor health habits or other factors that could contribute to illness, statistical associations found between disease and passive smoking could be incidental or misleading.⁶⁸

The public health community, at least as represented by these Government agencies, is of the opinion that the weight of the evidence shows that exposure to passive smoke constitutes a small, but real, risk of lung cancer. However, the tobacco industry, some researchers, and some others question that conclusion.

⁶⁷ Heather. G. Stockwell, Allan L. Goldman, Gary H. Lyman, Charles I. Noss, Adam W. Armstrong, Patricia A. Pinkham, Elizabeth C. Candelora, and Marcia R. Brusa, "Environmental Tobacco Smoke and Lung Cancer Risk in Nonsmoking Women," *Journal of the National Cancer Institute*, September 16, 1992, vol. 84, pp. 1417-1422.

⁶⁸ Huber, et al., (1992) and Steenland (1992), present a tabular summary of the heart disease and passive smoking literature. The respiratory illness in children and passive smoking literature are surveyed in Environmental Protection Agency (1992).

Thank you very much, Mr. Biley. I am trying to see if we can maybe move these tables up and get some more chairs in so that people can sit down. Is that something staff has any advice for us, as to whether that is going to be possible?

I apologize to all of you who are standing. I know there are a lot of people who wanted to be here. That is the best we are going to be able to do.

[The statements of Hon. Mike Synar and Hon. Mike Kreidler follow:]

STATEMENT OF HON. MIKE SYNAR

Mr. Chairman, I would like to thank you for holding this hearing on H.R. 3434, The Smoke-Free Environment Act of 1993. The impetus behind this hearing is not only the 419,000 people who die each year from smoking related cancer and heart disease, but the 50,000 non-smoking Americans who die annually from inhaling the chemicals of "passive smoking." The American Medical Association in its testimony estimates that 35,000 of these deaths are from heart disease, 3,000 from lung cancer, and approximately 12,000 from other cancers.

At a time when American businesses are having to tighten their belts, it is well worth noting that smokers on average cost companies \$1,000 a year because of decreased productivity and increased health care costs. This \$1,000 a year does not even take into account the additional health risks of non-smokers who must work in smoke-filled environments.

Companies like McDonald's and Taco Bell have recognized that the Environmental Tobacco Smoke Bill is fair. The bill protects the rights of both non-smokers and smokers by allowing workers and customers to smoke as long as there is a separately ventilated area. H.R. 3434 will also create a level playing field for all businesses and ensure that everyone is subject to the same environmental tobacco smoke standard.

H.R. 3434 would not deprive people of their ability to smoke cigarettes but would force them to act in a responsible manner so as not to endanger the health of others. This legislation, along with the regulation of cigarette content, that I have proposed in H.R. 2147, The Fairness in Tobacco and Nicotine Regulation Act, is essential to improving the health of smokers and non-smokers alike.

STATEMENT OF HON. MIKE KREIDLER

I'm glad you are holding another hearing on this issue, Mr. Chairman. Since our last hearing, the Armed Forces, the State of Maryland, and McDonald's and other fast food outlets have acted to ban smoking in workplaces and other public areas.

I am proud to tell you that, this week, the Washington State Department of Labor and Industries adopted rules prohibiting smoking in offices throughout the State. That is a major step to safeguard the health of Washington workers, and I commend it.

There are reports that OSHA is preparing to regulate indoor air quality, including environmental tobacco smoke, in workplaces nationwide. I hope that goes forward, and begins with a smoking ban to deal with the most widespread problem and the one most easily solved.

Meanwhile, I look forward to working with you to enact this legislation.

Mr. WAXMAN. I want to thank the four of you at the table for coming today. We are looking forward to hearing what you have to say. What we do here is we will take everything down on a tape, and then they are going to type it all up, and we will have a record of everything that is said at the hearing. All of the members of the committee will get a chance to read that record. So, what you say will be really important, because we are going to share it, not only with the people who are here today, but with others who are going to read it and hear about it and I think be influenced by it. Jason, why don't we start with you?

STATEMENTS OF JASON EMMONS, NILES, MICH.; MEGAN UDELL, SOUTH ELGIN, ILL.; LAUREN S. MINOR, LARGO, MD; AND RICHARD B. HEYMAN, ON BEHALF OF AMERICAN ACADEMY OF PEDIATRICS

Mr. EMMONS. Good morning. I am Jason Emmons from Niles, Mich. I am 10 years old, and I attend Trinity Lutheran School in Berrien Springs, Mich. I am very pleased to be here today on behalf of the Coalition on Smoking or Health, to share my views on possible laws to make all public places smoke-free. I have a right to breath clean air in all public places. It is not fair for me to walk into restaurants or any other public place and be worried about having an asthma attack.

It is a joke to have non-smoking areas and smoking areas in the same room, because there is no visible wall to keep the smoke in one area. I should not have to hold my breath when walking through a smoke-filled area of a shopping mall. Other people who are affected by tobacco smoke should not have to either. That is why legislation this committee is considering to make air and public places clean again is the kind of action the public needs.

Take it from someone who knows. It is not fun to have an asthma attack because of someone else's smoke. In case you do not know, your eyes water and you start to wheeze when you have an asthma attack. It feels like someone is strangling you. You just cannot breath. If you want to know how it really feels, try holding your breath for a long long time and then put a pillow over your face and try to catch your breath. I do not want to have other kids and grown-ups to have to feel this way, especially in places where they have to go everyday. It is no fun to have to use inhalers and have breathing treatments that sometimes barely work to keep from being sick or to keep breathing everyday.

Every other kid and I in the United States deserve clean air to breath in public places. I believe that the Smoke-Free Environment Act is the best step for making this happen. I look forward to going to places where other kids go without getting sick in the future.

Thank you.

Mr. WAXMAN. Thank you very much, Jason. I appreciate that testimony. Megan?

STATEMENT OF MEGAN UDELL

Ms. UDELL. Hi. My name is Megan Udell. I am a sixth-grader at Clinton Elementary School in South Elgin, Ill. I enjoy basketball and played on an all-boys' team earlier this year. I like swimming, writing stories and reading too. When I grow up I want to be a camp counselor and director for Camp Super Kids. This is a camp put on by the American Lung Association for children with asthma like me. I am glad to be here today on behalf of the American Lung Association to share with you the effects of environmental tobacco smoke on my asthma. I will also talk about the smoke-free environment and how it can improve my health.

At 18 months-old, my family knew that I had asthma and that breathing bad air would cause me to become sick. As I grew older, they helped me to learn how to take care of myself, especially after being around air that would affect me. Now, at age 11, I take 3 medications a day to control my asthma and breathing. As you

know, I carry my inhaler with me at all times, but especially in public places where there is smoking. I know that tobacco smoke will trigger an asthma attack. It happens very often. It usually triggers lots of coughing and wheezing, my chest gets tight and I have a hard time breathing. My inhaler helps me in some public places, but not all of them. If it is really bad in some restaurants or other places, then I go home and use my nebulizer machine to control my breathing. Breathing tobacco smoke is a real problem for me. It cuts my visits to McDonald's and shopping malls short. Sometimes we have to order at fast food restaurants so that I won't inhale tobacco smoke too long. It hurts when my family and friends have to stop doing things we like because of smoking. Unfortunately, this almost happened last summer during a family visit to Great Adventure amusement park. I had been excited about it for a long time and looked forward to the rides and games, but tobacco smoke was all over the place, even in the public restrooms. The whole time I was afraid that breathing tobacco smoke might trigger an asthma attack, and it ruined the family's weekend.

I cannot tell you how important the Smoke-Free Environment Act would be in places like this. It would help keep smoke out of public parks, family restaurants and shopping malls, and keep kids with asthma like me happy and well. I believe our Government needs to take into account the lives and rights of kids like me. We deserve to go to all of the places other people do and stay healthy while we are there. Simple smoking in non-smoking sections with just dividers do not work. We all need greater protection and the Smoke-Free Environment Act has the best chance of doing this.

I hope that I have been able to provide you with some ideas of how the Smoke-Free Environment Act will help all of us. Please, think about people with asthma and kids like me as you consider it. It will ensure us that most places away from home will be trouble-free. Thank you.

Mr. WAXMAN. Thank you. Excellent job, Megan. Thank you very much.

Lauren.

STATEMENT OF LAUREN S. MINOR

Ms. MINOR. Hi. My name is Lauren Minor. I am 8½ years old, and I live in Largo, Md. I attend Oakcrest Elementary School. I have had asthma ever since I was a baby. Because of that, secondhand smoke is very bad for me. I think it should be stopped because it can put people's lives in danger when someone else smokes around them. Secondhand smoking can also make you uncomfortable when you go out places.

One day I was at a restaurant and three ladies came in and sat down at the table next to me and my family. They started smoking and soon me and my grandmother were coughing. We had to finish our dinner very fast. We got up and left the restaurant.

Another time when I was at the shopping mall I was waiting for someone on a bench. A man sat down next to me and started smoking. The smoke made me start coughing and wheezing. I had to go outside to catch my breath and wait until the man left.

The last thing I want to talk about is when I went to Chuck E. Cheese, a pizza parlor. There was—we were sitting at a booth

when a family came and sat behind us and started smoking. So, we had to move to a different booth.

A couple of weeks ago, a McDonald's near my house became smoke-free. I was very happy. This means that when I eat there I do not have to worry about whether I will be able to eat all my food without someone smoking a cigarette. I can leave when I want to instead of being forced to leave by someone else. I do not think it is fair that I have to leave someplace just because somebody wants to smoke. They should have to leave instead of me and other people who do not like smoke.

People who smoke should think about how they make other people feel. They should stop smoking around everyone else for the sake of my life and other people's lives. Whatever you can do to help I would appreciate.

Thank you for letting me speak.

Mr. WAXMAN. Thank you. Terrific job, Lauren. Thank you.

Mr. Heyman.

STATEMENT OF RICHARD B. HEYMAN

Mr. HEYMAN. Good morning, Mr. Chairman. My name is Richard Heyman. I am a practicing pediatrician in Cincinnati, Ohio. It is my pleasure to appear before you today on behalf of the American Academy of Pediatrics, which is a group of 47,000 pediatricians practicing throughout the United States.

We are delighted to be a part of the movement which is taking place right now, as our country comes to grips with the crippling effects of environmental tobacco smoke. The American Academy of Pediatrics strongly supports the Smoke-Free Environment Act, H.R. 3434. The Environmental Protection Agency's 1993 report on the respiratory effects of passive smoking is a landmark document which extensively reviews the research that has been done in this area. The Surgeon General's 1994 report, Preventing Tobacco Use Among Young People, is a veritable textbook defining the toxic effects of smoke upon children. The 1994 position paper by the American Academy of Pediatrics, entitled Tobacco-Free Environment—An Imperative for the Health of Children and Adolescents, is a clear acknowledgment by that nation's—by our Nation's leading child health care experts that this continued assault on our Nation's youth is unacceptable and intolerable.

You have heard this morning from three young people who have given you very poignant testimony about the effects of passive smoke upon young children. I would like to add to that today from my perspective as a practicing pediatrician. Children are affected by environmental tobacco smoke in four principal ways. There is clear and indisputable evidence that smoking during pregnancy puts the fetus at risk and increases the likelihood of perinatal complications. There is further evidence that exposure to passive tobacco smoking—that is, a mother who breathes environmental tobacco smoke, also puts her fetus at risk.

Infants and children exposed to environmental tobacco smoke have a greatly increased incidence of respiratory problems, the development of asthma, the development of pneumonia, and other conditions which require hospitalization. You have heard from three young children, whose lives are terribly impacted, who are

frightened to go out because children who have asthma and other chronic lung conditions, cannot be in places where there is environmental tobacco smoke.

Finally, let's not lose sight of the fact that when young people see cigarette smoking, they see that as normal behavior. They see that as role-modeling behavior, and it certainly influences our young people to begin a smoking career.

Let me expand briefly on just a few of these items. We know that women who expose their infants to the toxicity of inhaled tobacco smoke, risk the delivery of a premature infant, the delivery of an infant who is small for gestational age, has intrauterine growth retardation and lung malformation. It is a major cause of complications such as cerebral palsy. It is a major cause of complications such as learning disabilities and behavioral problems. There can be no question that there is an association between sudden infant death syndrome and exposure to tobacco smoke.

Research has shown recently that mothers who smoke actually have cigarette byproducts incorporated into the hair of their offspring. Furthermore, this research has shown a very frightening concept, and that is that women who do not smoke, but who go to restaurants, or who go to sporting events where there is tobacco smoking, their infants are born with environmental tobacco smoke products in their bodies as well.

The data on the effects of environmental tobacco smoke on the young respiratory tract is incontrovertible. Day, after day in my practice I see the Laurens and the Jasons coming into my office. These are children whose lives are dreadfully impacted by environmental tobacco smoke. Those of us who do not have asthma, and those of us who do not live in the fear of coming upon a cloud of smoke and who treat that cloud of smoke as nothing more than a nuisance, we cannot appreciate what it is like for these kids to not be able to go to a restaurant, to not be able to go to a sporting event, to not be able to go to a shopping mall without this terrible fear that everything is going to be cut short. They are going to have to head back home to their nebulizers and have their day and their outing ruined. That is not fair to these children.

Furthermore, children suffer from a variety of respiratory problems other than just asthma. Chronic hearing loss, related to ear infections, chronic school loss, related to recurrent upper respiratory infections. These are all very real problems that I and my colleagues throughout the country see on a daily basis.

The Surgeon General's report on tobacco use by young people is a splendid description of why children begin to use tobacco and how perhaps to prevent it. Among the points the Surgeon General's report makes is that children begin smoking because of media and peer pressure, and that nicotine is an addicting substance. Our young people are extremely susceptible to what they think everybody else is doing and what they think is cool. The media continue to portray everyone who is happy and sexy and independent, and macho—that is what smoking does for you. Allowing smoking in public places, and allowing our teenagers and young people to witness this further reinforces that role model, further reinforces the fact that smoking, in fact, is cool and makes you powerful.

Mr. Chairman, to summarize, the American Academy of Pediatrics applauds your efforts to address the issue of the dangers of environmental tobacco smoke to our Nation's young people. As the principal health care providers, we support the prohibition of smoking from all public places where children are present. There is no justification for allowing a selfish minority to light up whenever they wish, and thereby endanger everyone else. Environmental tobacco smoke is a severe health hazard to our young people. It makes them sick. It makes them miserable. It makes them frightened. It makes no sense. It is not fair.

I thank you, Mr. Chairman.

[The prepared statement of Mr. Heyman follows:]

**TESTIMONY OF RICHARD B. HEYMAN, M.D.
ON BEHALF OF THE AMERICAN ACADEMY OF PEDIATRICS
MARCH 17, 1994**

Good morning Mr. Chairman. My name is Dr. Richard Heyman. I am a practicing pediatrician from Cincinnati, Ohio, and it is my pleasure to appear before you today on behalf of the American Academy of Pediatrics, whose 47,000 fellows are dedicated to the health, safety and well-being of infants, children, adolescents and young adults. We are delighted to be part of the history being made as our country comes to grip with the crippling effects of environmental tobacco smoke (ETS).

The American Academy of Pediatrics strongly supports the "Smoke-Free Environment Act," H.R. 3434. The Environmental Protection Agency's 1993 report on the "Respiratory Effects of Passive Smoking" is a landmark document which extensively reviews the research that has been done involving, among other things, the effects of environmental tobacco smoke on children. The Surgeon General's 1994 report "Preventing Tobacco Use Among Young People" is a veritable textbook defining the toxic effects of smoke on children. And the 1994 position paper by the American Academy of Pediatrics "Tobacco-Free Environment: An Imperative for the Health of Children and Adolescents" is a clear acknowledgement by the nation's leading child health care experts that this continued assault on our nation's youth is unacceptable and intolerable. We applaud your Committee's actions in this area and are pleased to offer our support.

Children are affected by environmental tobacco smoke in 4 major ways:

1. There is clear and indisputable evidence that smoking during pregnancy puts the fetus at risk and increases the likelihood of perinatal complications.
2. Infants and children exposed to environmental tobacco smoke have a greatly increased likelihood of developing respiratory problems,

including asthma, chronic cough, ear infection and pneumonia.

3. Children with respiratory problems, such as asthma and cystic fibrosis, cannot tolerate the additional irritation tobacco smoke causes to their already compromised respiratory tract.
4. Young people who are exposed to smokers perceive smoking as a "normal" activity, and are more susceptible to pressure from peers and the media to take up the habit.

Permit me to expand on some of these items:

Women who smoke expose their infants to the toxicity of their inhaled tobacco smoke. We know that smoking during pregnancy has been associated with certain forms of childhood cancer, and that it doubles the likelihood of bearing a child with intrauterine growth retardation -- a major cause of perinatal complications and death as well as long term problems such as cerebral palsy and learning disabilities. The incidence of sudden infant death syndrome (SIDS) is higher among the offspring of women who smoked during pregnancy.

Furthermore, research has shown that infants born to mothers who smoke actually have cigarette by-products incorporated into their hair. This is a frightening concept -- but even more alarming is the fact that infants born to women who don't smoke, but who frequent places where there is ETS, **also** have that chemical in their hair. In other words, a non-smoking mother who breathes in passive smoke will transmit the toxic substances through her bloodstream where they are taken up by the growing infant's body. It gives a pregnant woman two choices: either stay home or risk inhaling chemicals that may cause serious and permanent damage to her unborn baby. That's not fair.

The data on the effects of ETS on the young respiratory tract is incontrovertible. Day after day in my practice I treat the children of smoking parents. We know that children exposed to cigarette smoke have an increased risk of many disorders because their

respiratory tracts are chronically irritated by the smoke and therefore produce extra amounts of thick mucus. They suffer from a variety of problems including upper respiratory infection, middle ear infection, and decreased pulmonary function. In addition, they're more likely to end up in emergency rooms, they suffer more hospitalizations for bronchitis and pneumonia and are far more likely to develop asthma. Many return week after week with infection after infection. Yet some parents just don't get the message that they've GOT to stop smoking and stop taking their children to places where they are exposed to ETS. And that's not fair!

Perhaps most poignant are the children with respiratory disability such as chronic asthma or cystic fibrosis. I have several of these kids in my practice, and they are really prisoners of their own tightly-controlled home environment, because the stress of ETS may set off an event which may not only uncomfortable but life-threatening. So, no restaurants for theses kids, no shopping malls, no sporting events -- things that we all take for granted are simply not available to these children. Why? So some other people can enjoy their tobacco smoking habit. Not fair!

The Surgeon General's report on tobacco use by young people is a splendid description of why children begin to use tobacco and how -- perhaps -- to prevent it. Among the points the Surgeon General makes are that children begin smoking because of media and peer pressure, and that nicotine is an addicting substance. Our young people are extremely susceptible to what they think everyone else is doing, and what they think will make them "cool." The media continue to portray smoking as a normal activity that is enjoyed by everyone who is happy, independent, successful, and sexy. Allowing smoking in public places permits this behavior to be modeled, and enhances the false impression young people have about smokers. The fact that a vast majority of present smokers wishes they had never started and expresses a desire to quit is lost on the young people who watch them light up. All they see is the nicotine addict seeking and receiving (apparent) pleasure. That's not fair, either.

Mr. Chairman, to summarize, the American Academy of Pediatrics applauds your efforts to address the issue of the dangers of ETS to our nation's young people. As their principal health care providers, we support the prohibition of smoking from all public places where children are present. There is simply no justification for allowing a selfish minority to light up whenever they wish and thereby make other people suffer. Environmental tobacco smoke is a severe health hazard to our young patients. It makes them sick. It makes them miserable. It makes them experience pain and discomfort. It makes . . . no sense. And it's not fair.

Thank you Mr. Chairman.

Mr. WAXMAN. I thank you very much, Mr. Heyman.

Megan, let me ask you a question. A lot of people are saying, especially smokers, that they enjoy smoking and we are all just making too big a deal of it if they just light up a cigarette in a restaurant or in an amusement park—that we should let them smoke and not interfere with them. What would you tell a smoker if he said that to you?

Ms. UDELL. I just—

Mr. WAXMAN. Tell me about your experience.

Ms. UDELL. I just would say, well, that is your opinion, and you may think it is your right, but it is also my right to breathe clean air, and you are taking away that right by puffing your cigarette smoke in my face and it stinks too. It is just a disgusting habit.

Mr. WAXMAN. Well, so you do not approve of the habit. Tell us what it has meant to you when you have gone places? Is it just annoying to you? The three of you have asthma. What does it mean if someone has asthma and you get cigarette smoke?

Ms. UDELL. You just feel like every breath you take, you are getting little and little more air, and you have to use your—and I have to use my inhaler. It is just—I do not like it.

Mr. WAXMAN. Yes. Jason, you were telling us a story in your testimony about how you went into a restaurant, and you had a problem with somebody else smoking. Has that just happened once or more than once?

Mr. EMMONS. It has happened a couple of times. I have gone into a restaurant and they have had two seats, side-by-side, and right, and one of them is non-smoking and one of them smoking. It just happens that smoke drifts over and lands right in my face, and there is nothing to hold it on that one side to keep it away from me.

Mr. WAXMAN. What happens to you?

Mr. EMMONS. Well, usually, I get tight in the chest, my chest starts to hurt. It feels like someone is strangling me. I can hardly breath. It is really hard to eat because you are inhaling smoke and everything. It is just hard.

Mr. WAXMAN. Lauren, you were talking about going to McDonald's. Now you are happy to go to McDonald's because they do not have smoking anymore. Do you have that same kind of problem that Jason has if you find somebody smoking nearby?

Ms. MINOR. Yes.

Mr. WAXMAN. Do you ever have to leave a place where you wanted to go because somebody was smoking and you could not handle it?

Ms. MINOR. Yes.

Mr. WAXMAN. Tell me about that. Do you remember a case like that?

Ms. MINOR. I had to leave a restaurant once when I was eating my dinner because somebody came in and sat right beside us and started smoking.

Mr. WAXMAN. Did any of the three of you ever have to go to the doctor or hospital because you were exposed to it?

Ms. MINOR. Yes.

Mr. WAXMAN. Really? What happened?

Ms. MINOR. I had an asthma attack.

Mr. WAXMAN. What does that mean to have an asthma attack?

Ms. MINOR. It means that your chest closes up on you and you can hardly breathe.

Mr. WAXMAN. So, it is a big deal to the three of you if someone else is smoking. When people say, well, maybe we ought to have more scientific research and all of that, you do not need more research to know how it affects you when you want to go to a place like a restaurant or an amusement park. You just want to go to a place where other kids go. I think what you are telling us is you do not think it is fair that you should not be able to go to those places just because somebody who smokes will not stop smoking for that period of time while they are there. Is that what you are telling us?

Ms. MINOR. Yes.

Mr. WAXMAN. Thank you very much. Mr. Hastert, do you have some questions?

[No response.]

Mr. WAXMAN. Mr. Cooper?

[No response.]

Mr. WAXMAN. Well, the four of you have really been terrific. I very much appreciate you coming. I know some of you have come a long way. I appreciate you coming here to tell us about your views on this legislation.

Our next group of witnesses is going to give us a different perspective on the issue. Mr. Roy Vagelos is the chief executive officer of Merck & Company; Mathias J. DeVito is the chairman and CEO of the Rouse Company here in Columbia, Md; Margaret Jordan is vice president for health care and employee services for Southern California Edison; Jacque Carter is with the Shopping Centers of Southwest Michigan; and G.A. Julin is chairman of the Morlin Management Corporation in Los Angeles.

I want to welcome this group. I wonder if we could have the attention of everybody? Before I ask this panel to—I want to welcome this group of panelists who have come from other parts of country as well to give us your views on whether we ought to have a smoke-free environment legislation here at the Federal level or not. Your prepared statements, if you have prepared statements—I think all of you do—they will all be in the record in full. We would like to ask you to take around 5 minutes and give us your views, either summarizing the statement or however you want to present it to us.

Mr. Vagelos, why don't we start with you?

**STATEMENTS OF P. ROY VAGELOS, CHAIRMAN, MERCK & CO.;
MATHIAS J. DeVITO, CHAIRMAN, ROUSE CO.; MARGARET H.
JORDAN, VICE PRESIDENT, SOUTHERN CALIFORNIA EDISON
CO.; JACQUE CARTER, SHOPPING CENTERS OF SOUTHWEST
MICHIGAN; AND GEORGE A. JULIN III, CHAIRMAN, MORLIN
MANAGEMENT CORP.**

Mr. VAGELOS. Thanks. Mr. Chairman, and members of the subcommittee, my name is Roy Vagelos. I am a physician, biomedical scientist and chairman and chief executive officer of Merck. I am pleased to be able to testify today, not as a representative of the

pharmaceutical industry, but as the CEO of a company that has acted to eliminate smoking in the workplace.

When I testified before this subcommittee last month on health care reform legislation, I presented a hypothetical example to illustrate the severe adverse effects the Health Security Act could have on our companies' more than \$1.3 billion annual research effort. Today I would like to relate another hypothetical situation for your consideration. Imagine for a moment that I was able to come before you today and announce that Merck's research had produced a startling new therapeutic discovery. This new therapy would eliminate a significant risk factor in several diseases, including lung cancer, arteriosclerosis and chronic obstructive pulmonary disease, and reduce the incidence of pneumonia, bronchitis, and the onset of asthmatic attacks. It could save 400,000 lives a year and more than \$70 billion in health care costs. This therapy would have no serious medical side effects. Finally, imagine that I was able to announce that Merck was making this therapy available immediately and without any charge whatsoever. This sounds too good to be true, but the fact is this possibility is real, without any new discovery from Merck's labs. We all know about this therapy and have known about it for years. It is the cessation of cigarette smoking.

Merck employs more than 29,000 employees in the United States. Along with their colleagues around the world, they are the heart and soul of our company. They are the innovators, the discoverers, the creators of new drug therapies that save lives and billions in health care costs. Mr. Chairman, they are too important to risk their health and lives to tobacco smoke. For this reason, we decided in early 1988 to launch a corporate policy that would prohibit smoking at all of our U.S. workplaces. We acted to protect the health of all employees, including those exposed to secondhand smoke. We encouraged employees to adopt a healthier lifestyle by quitting smoking.

As a physician and businessman, I knew that this was the right policy. The health consequences of smoking are beyond question, and the cost to my company in lost productivity, days lost to illness and rising health care costs due to smoking were no longer acceptable.

When we decided to pursue a non-smoking policy, we moved deliberately. Sixteen months before our policy went into effect, we discussed our plans openly with workers throughout the company. We launched an educational plan to explain the dangers of tobacco smoke, we built support for the policy among our workers, and we worked hard to treat with dignity the approximately 1/3 of our workers who smoked. To that end, we paid the full cost of approved smoking cessation classes for workers and their spouses. Many workers took these courses, others simply quit cold-turkey without our help.

As we moved forward, our plan included regular employee communications through in-house news articles, posters, and employee meetings. We organized special activities built around a non-smoking theme, and handed out buttons and T-shirts as we built awareness and excitement for September 1, 1989's start date. On that date, Merck ended all smoking in Merck-owned and leased buildings. In addition, many of our facilities chose to ban smoking fence

to fence—that is within the entire boundaries of our work sites. We do not have smoking lounges nor any other designated smoking areas. Our visitors and onsite contractors must adhere to our policy. Smoking is prohibited in company vehicles and at any offsite company-sponsored meetings or conferences.

Mr. Chairman, 4½ years after we implemented our smoke-free policy, I can report that it is an unqualified success. During the first 18 months of our policy, the number of Merck employees who smoked fell by 25 percent. Another 25 percent were motivated to reduce their smoking. Of course, even those who have continued smoking have had their exposure to tobacco smoke reduced by at least 8 hours per day. We believe that our policy attracts and keeps employees who are concerned about workplace health and safety. I am happy to report that we have seen very few violations of this policy. I have seen none.

Other companies now contact us on a regular basis to get information on how Merck implemented our policy. We are pleased to provide that information on a copy of which I have with me today for the record. As a company committed to the improvement of human health and well-being, we recognize that we had a particular responsibility to address the issues raised by smoking in the workplace and to provide our employees an environment free of the hazards of tobacco smoke. Our leadership has inspired others, and I am proud to have the opportunity to share our story with you today.

Thank you and I will be happy to answer any questions.

Mr. WAXMAN. Thank you very much, Mr. Vagelos. We are going to have some questions in a minute after we hear the others. Thank you for your excellent testimony.

Mr. DeVito, do you want to speak into one of the mikes? I just want to be sure you will be picked up.

STATEMENT OF MATHIAS J. DeVITO

Mr. DEVITO. Good morning, Mr. Chairman and members of the subcommittee. I am Matt DeVito, chairman and chief executive officer of the Rouse Company. I am very pleased to speak on behalf of our company in support of the Smoke-Free Environment Act of 1993.

The Rouse Company's business is the development and management of commercial properties, large shopping centers and office buildings located throughout the United States. We are best known for our regional shopping centers and for our urban marketplaces, such as Harbor Place on Baltimore's Inner Harbor, Faneuil Hall Marketplace in Boston, The Shops at National Place here in Washington, and others. We are a 4½ billion dollar corporation, and our headquarters are located a few miles away in our planned new city of Columbia, Md., which our company developed.

Our retail portfolio includes 70 large regional shopping centers and 8 village centers in Columbia occupying 47 million square feet of space. We are, with all of our retail and office properties, we are one of the largest developers—publicly-held developers in the United States. Recent data from our Research Department indicates that approximately 1 million men, women and children visit our re-

tail centers everyday. That is 360 million people who, in one way or another pass through our malls each day or every year.

Rouse Company Centers have been described as places for people, whether the property is an urban marketplace on the water, in a large city, or a very large suburban shopping center. People come there to meet other people, to enjoy entertainment, to eat and to shop. We want them all to enjoy these activities in a healthy environment.

In 1993, we made the decision that all common areas in Rouse Company retail centers would be smoke-free by the end of 1994. Prior to that we had been evaluating that issue for several years. Concurrently, we have been working with the managers of our office buildings and the leadership of BOMA, which will be testifying today, the Building Owners and Managers Association, to bring forward a comparable no-smoking policy for our office buildings and other commercial properties.

While our primary concern is the adverse health effects of secondhand smoke, there are other compelling reasons for being smoke-free. Eliminating smoking will reduce maintenance costs and reduce the chance of fires, especially trash can fires started by cigarettes, which are a very real hazard. We believe that a smoke-free workplace can reduce absenteeism, especially among those with respiratory illnesses.

Another important reason for our becoming smoke-free in our malls is that so many young people shop in our malls, and we do not want to provide an environment that might encourage young people to smoke. We are very conscious of each mall's place as an important community center, and we are a very hands-on landlord. We continue to look for ways to make our malls inviting to our shoppers. We know that nonsmokers find smoking very unpleasant and prefer not to spend several hours shopping in a smoke-filled environment.

Based on conversations with our merchants where we have instituted a smoke-free policy, our smoke-free policy has not had a materially adverse affect on our business. In fact, the managers of some of the centers which are now smoke-free, have received many many letters of thanks, support and compliments.

And finally, I would like to add that one of the Rouse Company's corporate goals is "to improve the quality of life in the communities where we operate."

Our decision to make the common areas of our centers smoke-free is clearly in support of this goal and, I believe, is the right thing for us to do.

I am proud that the Rouse Company has taken a stand on this issue. While we feel there are certain areas in the legislation which we believe need further clarification, I offer our company's support in legislatively addressing the need for a healthy, smoke-free environment in commercial facilities. In addition, the passage of this legislation will be a tremendous help in leveling the playing field for the business community. No one business would be economically disadvantaged for doing the right thing and becoming smoke-free. Thank you. I will be glad to answer any questions at the appropriate time.

Mr. WAXMAN. Thank you very much, Mr. DeVito.

Ms. Jordan, I am going to call on you. For those of you at the table and all of the other witnesses who are waiting, since we have a large number of witnesses who are going to testify today, I am going to use a timer so it will tell you when your 5 minutes are up. When you hear the bell, we would appreciate it if you would just conclude your remarks at that point. Otherwise, we are not going to get everybody a chance to be able to come in and testify and members to ask the questions.

Ms. Jordan.

STATEMENT OF MARGARET H. JORDAN

Ms. JORDAN. That is OK. I am accustomed to the timer. Good morning, Mr. Chairman and members of the subcommittee. My name is Margaret Jordan, and I am vice president of health care and employee services for Southern California Edison. Southern California Edison is the Nation's second largest electric utility, providing services to nearly 11 million people in the 50,000 square mile area in central and southern California.

As a large, self-insured employer—self-insured for health care costs, we provide health benefits to 55,000 people. That is our 17,000 employees and their 27,000 dependents and 11,000 retirees. Since January 1st, 1992, SCE has been smoke-free in all of our enclosed facilities at the 300 work locations, and all shared vehicles. I appreciate having the opportunity to testify on the Smoke-Free Environment Act of 1993 because it is really an important step towards protecting the health of the public and one which we at SCE enthusiastically support.

In May 1991, SCE launched a review of its smoking policy, the impact of smoking in the workplace and the feasibility of creating a smoke-free environment in our diverse facilities and work environments. The excess costs that we incurred estimated at that time as a result of smoking in the workplace were important drivers for us looking to the solution of trying to create a smoke-free environment. Using 1990 dollars at that time, we estimated that we were spending in excess of \$1,300 per year, per smoker in the workplace, for increased absenteeism, lower productivity, passive smoke effects, excess cost in fire/accident insurance, life insurance, workers' compensation and occupational health awards. Based on the number of smokers we had at that time, this amounted to more than \$4 million per year in excess cost for the treatment of the diseases which the Surgeon General at that time said were smoking-related. We looked at our claims and we estimated that we paid more than \$8 million a year in our indemnity plan alone and probably another \$4 million to HMO's who took care of some of our members.

Since January 1st, 1992, we went smoke-free. We have proven that when a worksite goes smoke-free, more smokers quit smoking. The percentage of our workforce who smoke has dropped from 19.1 percent to 15.9 percent. And those who continue to smoke have decreased the number of cigarettes that they smoke per day on average.

While we have created a smoke-free workplace for our employees, many of the 27,000 spouses and dependents who work for other companies which do not have smoke-free policies may be exposed to environmental tobacco smoke within their workplaces, and we

carry the burden of their excess medical expenses caused by this exposure. Further, if they are in a smoke-free environment, they would be more likely to quit smoking as well if they do. By the dependents being in smoke-free environments, our employees will be given more support for quitting for those who still smoke.

Many of our employees work in the community and in public and private facilities as we provide our electrical services, and they get exposed in their day-to-day work to this health hazard while performing their jobs in the community. Any societal efforts to help us reduce smoking will benefit us at SCE and other employers through decreased medical and business costs. To really have a smoke-free workplace and protect people we need societal norms against smoking in public places. Policies need to be commonly in place across the Nation.

The Smoke-Free Environment Act of 1993 is good public policy. It is also good public health policy. Smoke-free environments must become our societal norm, and the Smoke-Free Environment Act could be one of our Nation's greatest health care accomplishments, particularly in this year in which we are most concerned about health care reform. Thank you very much. I will be happy to answer any questions.

[The prepared statement of Ms. Jordan follows:]

STATEMENT OF MARGARET H. JORDAN

Mr. Chairman and members of the subcommittee: My name is Margaret H. Jordan. I am vice president of health care and employee service for Southern California Edison Company (SCE). SCE is the Nation's second-largest electric utility, providing service to nearly 11 million people in a 50,000 square-mile area in central and southern California. Southern California Edison—as a large self-insured employer—provides health benefits for 55,000 people—18,000 employees, their 27,000 dependents, and 10,000 retirees and their dependents. Since January 1, 1992, SCE has been smoke-free in all enclosed facilities at its 300 work locations and all shared vehicles.

I appreciate having the opportunity to testify on H.R. 3434, the Smoke-Free Environment Act of 1993. It is an important step toward protecting the health of the public and one which we at SCE enthusiastically support. I would like to discuss with you our reasons for creating a smoke-free environment for our employees and why we support the creation of smoke-free environments in all public buildings.

In recognition of the mounting evidence on the health effects of environmental tobacco smoke, in May 1991 SCE launched a review of its smoking policy, the impact of smoking in the workplace and the feasibility of creating a smoke-free workplace in our diverse facilities and work environments. These work environments include corporate offices, customer service centers, underground vaults, transmission substations, mobile units, warehouses and control rooms in generating stations. We determined that the only way to adequately protect our employees from exposure to environmental tobacco smoke was to eliminate it from our facilities.

The excess costs incurred as a result of smoking in the workplace were also important drivers in our decision to go smoke-free. We looked at the non-medical costs of smoking and we looked at our health care claims experience with smoking related disease. Using 1990 dollars we were spending an estimated excess of \$1,300 per year per smoker in the workplace for increased absenteeism; lower productivity; passive smoke effects; and excess cost in fire/accident insurance, life insurance, workers compensation, and occupational health awards. Based on the number of smokers we had, this amounted to more than \$4 million per year in excess costs. For the treatment of diseases which the Surgeon General has said are smoking related, we also pay more than \$8 million a year in our indemnity plan alone and probably another \$4 million to HMO's.

Throughout 1991 management and labor at SCE worked together to develop a plan to implement a smoke-free environment policy. A joint task force developed the policy, solicited employee input, planned the communications campaign, provided smoking cessation resources and support, and assisted in implementing the policy,

which went into effect on January 1, 1992. The policy was well received by employees, both smokers and nonsmokers.

We have proven by our own experience, as well as by the experiences of other organizations, that when a work site goes smoke-free, more smokers quit smoking. The percentage of our work force who smoke has dropped from 19.1 percent to 15.9 percent, and those who continue to smoke have decreased the number of cigarettes they consume per day—on average three less per day. This improves the health of smokers as well as those who share their workplaces and their homes.

While we have created a smoke-free workplace for our employees, many of their 27,000 dependents work for other companies which do not have smoke-free policies. These dependents, for whom we provide medical coverage, may be exposed to environmental tobacco smoke within their workplaces. We carry the burden of their excess medical expenses caused by this exposure. There is an additional benefit of the dependent's workplace being smoke-free. If they are in a smoke-free environment, they will be more likely to quit smoking as well. It is well proven that if someone in your household smokes it will be more difficult for you to quit. By the dependents being in environments which encourage them to quit smoking, our employees are given more support for quitting. Thus, any societal efforts to reduce smoking will benefit us and other employers through decreased medical and business costs.

We recognize that our employees do not work in a protective cocoon. Many of our employees work in the community, in public and private facilities providing our services. While we have protected them within our own facilities, they can be exposed to this health hazard while performing their jobs in the community. To really have a smoke-free workplace and protect people, we need societal norms against smoking in public places. Policies need to be commonly in place.

The Smoke-Free Environment Act of 1993 is good public policy. We have been successful in eliminating the risk in our own workplaces, but not until smoke-free environments are the societal norm will our employees, their dependents and the public at large be protected from the health hazard of environmental tobacco smoke.

Mr. WAXMAN. Thank you very much, Ms. Jordan.
Ms. Carter.

STATEMENT OF JACQUE CARTER

Ms. CARTER. Thank you. Congressman Waxman, subcommittee members, and other distinguished guests, my name is Jacqueline Carter. It is an honor for me to be here today. I appeared before you as general manager of McCamly Place in Battle Creek, Mich., a constituent of Congressman Upton's, but residing in Kalamazoo, Mich., and a member of Shopping Centers of Southwest Michigan, a collective group of five competing malls that joined forces to go smoke-free in all public and common areas in 1993.

I am here to urge your vote in favor of H.R. 3434, also known as the Smoke-Free Environment Act of 1993. Going smoke-free was not done without much deliberation on the part of the managers, staff, and owners of the various properties. Potential loss of business was discussed at length. We recognized this was a risk, a concern of every one of our businesses in our malls. We came to the conclusion that the most important factor was that secondhand smoke was now a public health issue. It is very important to remember that the issue here is public health and is not, nor has it ever been the person behind the cigar, the pipe, or the cigarette. We hope more business will follow our lead, but without legislation, it can be a risk business-wise.

We are pleased to report that there has been no loss of sales or traffic that can be attributed to going smoke-free in any of the malls we represent. We believe this is a significant piece of information for businesses contemplating going smoke-free and for those of you who will be voting on legislation such as H.R. 3434.

Our efforts were unique. Competing malls rarely cooperate on anything in their respective market areas; but this issue went beyond sales. We believed we had a social responsibility in our market areas. The public health issue of secondhand smoke far outweighed everything else. We enlisted the support of the American Cancer Society, Kalamazoo County Department of Health Services, Calhoun County Health Department, West Michigan Cancer Center, the area's Tobacco Reduction Coalitions, in conjunction with the American Lung Association, and the American Heart Association, and several other organizations, as well as our own companies, staff and employees.

Time, education and understanding of the issues were very important. The new policy was announced in June 1993, with implementation scheduled for September 1, 1993. All properties offered smoking cessation classes at the individual property's expense for every employee in the mall who wanted to quit smoking. In my facility, two of seven staff members in the immediate management office only quit smoking as a result of our going smoke-free. They are delighted that the implementation of the smoke-free policy was the catalyst for them being on the road to a healthier life. It is doubtful that they would have made their effort on their own.

There were those who objected, but they were in the minority. Many felt we had not gone far enough. As an example, my office received a phone call from a mother who was delighted that we had gone smoke-free. She had an asthmatic toddler, similar to those that you heard this morning, who could not be near any kind of smoke. When we explained that only the public and common areas were smoke-free, and that the individual lease premises and restaurants still permitted smoking, she said that although she appreciated us going smoke-free, because of the severity of her daughter's asthma, she would still not be able to come to McCamly Place. It is this woman's child, among hundreds of thousands of others, who will also benefit from the passage of H.R. 3434.

The passage of this bill will allow businesses, whose primary concern is the loss of sales, to be on a level playing field with their competitors. This is extremely important, and a point I hope you will consider as you contemplate your vote, which I hope will be a yes vote. The long-term benefits for every business are healthier people, less absenteeism, less sick time, reduced operational expenses, and potentially an impact on the number of terminally ill people, as a result of smoking, and/or secondhand smoke. The benefits are immeasurable.

The unfortunate thing is that the benefits are not able to be totally quantified at this point. We do know that secondhand smoke is a class A carcinogen and that it does cause cancer. We cannot ignore that as responsible business people.

Thank you for the opportunity to be here today.

Mr. WAXMAN. Thank you very much, Ms. Carter.

Mr. Julin.

STATEMENT OF GEORGE A. JULIN III

Mr. JULIN. Thank you. Good morning, Mr. Chairman and members of the subcommittee. Thank you for the opportunity to publicly address the subject of secondhand tobacco smoke. As first vice

president of the Building Owners and Managers Association, International, my fellow BOMA members and I recognize that an unwanted exposure to secondhand smoke has long caused discomfort, complaints and adverse health risks among the occupants in office buildings. BOMA is an organization representing over 5 billion square feet of commercial office space, and has undertaken an unconventional and some would say controversial approach to managing this direct threat to good indoor air quality. We have petitioned Congress to institute a national ban on smoking in the workplace. This effort has struck many people as quite odd—the association representing commercial real estate, calling for more regulation. I can assure you, Mr. Chairman, we would not be here unless we could not do the job ourselves. On this issue, we need your help.

Commercial property owners work to provide a comfortable, safe, and healthy work environment for our tenants in exchange for rent. The rate is negotiated along with the rest of the lease. That is where we face an obstacle in banning smoke ourselves. Most lessees just are not able to place a voluntary restriction on their employees when it comes to smoking. Short of local, State or Federal laws which prohibit workplace smoking, most commercial office occupants will be allowed to continue to smoke in the lobby the hallway or even at their desk.

We are pleased to see that the State of Maryland has already enacted a no-smoking policy in office buildings. We understand now that yesterday the State of Washington enacted a similar policy.

Secondhand tobacco smoke is an annoyance, a contaminant and, according to the EPA, a class A carcinogen. Clearly, it does not belong indoors. Enough incentive, in the way of a rent check, already exists for building management to provide for high-quality indoor air. Unfortunately, permissible secondhand smoke works directly counter to our efforts aimed at improving indoor air. Contrary to popular belief, increasing air circulation does little more than dilute the problem. We need to remove source contaminants to improve indoor air quality. This class A carcinogen must be eliminated, and H.R. 3434 when enacted will accomplish that goal.

The facts are in. Secondhand smoke is the worst workplace health hazard. Secondhand smoke is an indoor air contaminant. Secondhand smoke is a killer, and we need your help to get rid of it. You will not see us up here too often seeking regulation, but we are seeking it now. Fellow members across the country are looking to Capitol Hill for assistance in providing a healthy, safe and comfortable office workplace. There are still people who are subjected to the cancerous exhales from smokers in the next office, but our hands are tied in trying to protect them. They need your help and so do we.

[The prepared statement of Mr. Julin follows:]

**Written Statement of the
Building Owners and Managers Association (BOMA) International
on the Smoke-Free Environment Act (H.R. 3434)**

**March 17, 1994
Subcommittee on Health and the Environment
House Energy and Commerce Committee**

Thank you for the opportunity to publicly address the subject of secondhand tobacco smoke. My name is George A. Julin III, and I am Chairman of Morlin Management Corporation in Los Angeles, California. As First Vice President of the Building Owners and Managers Association (BOMA) International, I am well aware that unwanted exposure to secondhand smoke has long caused discomfort, complaints and adverse health risks among the occupants in office buildings.

BOMA is the oldest and largest trade association representing office building professionals. BOMA represents over 15,000 members and over 5 billion square feet of office space. BOMA has taken an unconventional - and some would say controversial - approach to managing this direct threat to good indoor air quality: we have petitioned Congress to institute a national ban on smoking in the workplace. In January, 1993, BOMA's Board of Governor's unanimously agreed that a federal ban was the only effective way to eliminate secondhand smoke from the workplace (see attached).

BOMA has worked with Chairman Waxman and his staff over the past several months to fine-tune a bill that would go a long way to protecting the nation's workers, and we commend him for his leadership on this important issue.

Environmental Tobacco Smoke is Major Indoor Air Contaminant

Environmental tobacco smoke is a significant source of contamination to indoor air. According to the Environmental Protection Agency, it is a deadly contaminant -- a Class A Carcinogen. Environmental tobacco smoke clearly does not belong indoors.

While environmental tobacco smoke is not the only indoor air contaminant, and its ban will not address all indoor air quality problems, secondhand smoke is easily identifiable, and can be completely removed. EPA has estimated that the cost to ban smoking in all commercial buildings is far less than the benefits gained through this legislation.

Increased Ventilation is Not the Solution

Opponents of this bill would have you believe that banning smoking is not necessary - that simply increasing ventilation - the amount of outside air brought into a building - would achieve the same results. The truth, however, is that increased ventilation will only dilute the smoke, not remove it. Elimination is the best course of action.

BOMA firmly believes that the best approach to maintaining healthy indoor air is a combination of management practices: source reduction and occupant behavior changes; adequate ventilation; and proper maintenance and cleaning practices.

Tenant Education

To this end, BOMA believes that building tenants play an important role in managing their environment. BOMA has produced a tenant brochure, *Improving the Great Indoors*, designed for building managers to distribute to their tenants to educate them on their shared responsibility in controlling sources of indoor air pollution. Eliminating smoking in the workplace is one of the recommended approaches. Over 35,000 copies have been distributed to date.

Building Owners Cannot Effectively Ban Smoking in Buildings

Commercial property owners work to provide a comfortable, safe and healthy work environment in exchange for rent. The rate is negotiated along with the rest of the lease - and that is where we face an obstacle in banning smoking ourselves. Building owners and managers have little authority over what activities take place within a tenant's suite.

More and more, we are seeing new office buildings establish non-smoking policies. But without any enforcement mechanism, even this approach has its shortcomings.

Short of local, state or federal laws which prohibit smoking, most commercial office occupants are allowed to smoke in the lobby, in the hallways, in the staff lounge, or even at their desk.

Enforcement and Liability

BOMA supports the proposed ban as called for in H.R. 3434. However, we do share some concerns in the implementation of a ban. Building owners and managers must not be held liable for any smoking that does occur in the workplace once a ban is in place and tenants are notified. Owners and managers of multi-tenant office buildings should also not be held responsible for enforcing such a ban, and in effect, left "policing" their tenants.

Congressman Waxman has effectively addressed these concerns in H.R. 3434 by defining the "responsible entity", with respect to any public facility, as "the owner of such facility, except that in the case of any such facility or portion thereof which is leased, such term means the lessee."

Cigarettes - A Source of Office Fires

BOMA International regularly surveys building owners and managers on the causes of fires in office buildings. Data is collected on fires in various types of office buildings (e.g., low-rise, high-rise), locations of fires within buildings, number of injuries and fatalities, and damage to facilities (including everything from trash can fires to structural damage).

Smoking is consistently cited as the most common cause (more common, in fact, than electrical malfunctions) and can account for 26% of the fires in all buildings. It is also the easiest cause to prevent. These fires occurred most commonly in tenant space.

Cleaning and Maintenance Costs

BOMA estimates that the elimination of environmental tobacco smoke would significantly decrease cleaning and maintenance costs in buildings.

A study conducted by a BOMA member in a multi-tenant building located in Chicago, Illinois demonstrated a 10% overall reduction in cleaning costs. A reduction in cleaning requirements resulted from: the elimination of the need to clean ashtrays; decreased frequency for dusting (particularly on top of partitions); reduction in cleaning of venetian and horizontal blinds;

reduction of washing of HVAC vents; and decreased need for detail vacuuming in smoking areas and around desks.

H.R. 3434 is the Only Responsible Option

The facts are in:

Secondhand smoke is a workplace health hazard;

Secondhand smoke is an indoor contaminant;

Secondhand smoke is a killer.

We need your help to get rid of it.

You will not see us up here too often seeking regulation - but we are seeking it now. BOMA members across the country are looking to Capitol Hill for assistance and leadership in providing a healthy, safe and comfortable office workplace. There are still people who are subjected to the cancerous exhales from smokers in the next office. But our hands are tied in trying to protect them. They need your help -- and so do we.

* * *

Founded in 1907, BOMA International is a dynamic federation of 98 local associations whose members own or manage over 5 billion square feet of commercial office space in North America. The membership -- composed of building owners, managers, developers, leasing professionals, facility managers, asset managers, and suppliers of goods and services to the office building industry -- collectively represents all facets of commercial real estate. BOMA is firmly established as the respected resource on national matters affecting the industry, such as the Americans with Disabilities Act, indoor air quality, the phaseout of chlorofluorocarbons, tax issues, and more.

RESOLUTION
BEFORE THE
BOMA BOARD OF GOVERNORS
JANUARY 17, 1993
TUCSON, ARIZONA

Whereas, indoor air quality has been the focus of increased media, legislative and regulatory attention for the past several years, with expectations that the intensity of that attention will significantly increase in the months and years ahead.

Whereas, indoor air quality, as a market place demand within the commercial real estate industry, requires no regulation, but requires much information to address this situation effectively and efficiently.

Whereas, BOMA members have long pushed for further research on the sources and causes of indoor air quality problems, and we are adamant about the need for good guidance. We have worked with industry groups, environmental organizations and government officials in coordinating our efforts. We have also demonstrated a strong campaign to develop and distribute sound guidance information to prepare and improve the indoor air quality management programs in the commercial property arena.

Whereas, many legislative and regulatory efforts are underway to dilute or redistribute the sources of indoor air contaminants.

Whereas, BOMA firmly believes that the most effective course of action is to prevent contaminants from being introduced to the workplace in the first place.

Whereas, tobacco smoke has been identified as a leading cause of indoor air contamination, and has generated a great deal of concern within the medical/health community.

Whereas, in light of the EPA's recent classification of second-hand tobacco smoke as a "Class A" carcinogen, BOMA is even more concerned with the consequences to the health and well-being of office tenants, their employees and guests who are exposed to second-hand tobacco smoke in the workplace.

Be It Therefore Resolved, that BOMA would support a federal ban on smoking in the workplace, as part of an overall effort to improve the indoor environment. We do, however, have several concerns with a federal ban - first and foremost among them is that the enforcement of any ban should not be the responsibility of the nation's building owners and managers. The second concern is that any liability incurred must not apply to the owners and managers of commercial, rentable real estate when smoking does occur after a ban is imposed.

BOMA



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Mr. WAXMAN. Thanks to all of you for your testimony. You were in the room when we heard from the three kids with asthma. When I look at this issue I look at the tobacco industry on one side, and those three kids on the other. Their statements to us about what they have to go through when they go into public places is reason enough, as far as I am concerned, to say to the tobacco industry, no, you cannot win on this one. We have got to protect the rights of kids and others who want to go into public places. You all are representing businesses. I was interested, Mr. Julin in your statement that businesses very seldom come to Washington and ask for regulation. You are absolutely right.

I want to indicate, before I ask any of you any questions, that you are not the only ones from the business community that have contacted us asking for Federal legislation. The California Restaurant Association, the Nation's largest State restaurant association, representing over 10,000 restaurants, is supporting the bill, as is the Restaurant Association of Maryland; the American Council of Life Insurance, representing over 600 health insurance companies; the Health Insurance Association of America, representing over 300 health insurance companies; the National Medical Association, representing over 20,000 African-American physicians; the International Association of Fire Chiefs, representing 10,000 fire chiefs and senior fire officers; Joan Lunden, host of ABC's Good Morning America News Show; Mr. James Mason, who is the Former Assistant Secretary of Health during the Bush administration. Clearly, this is an unprecedented coalition of public health people across the political spectrum.

Mr. Vagelos, let me start with you. This is not the first time you have been before our subcommittee this year, because we are working on health care reform. Mr. Cooper and I particularly are very involved, as are all of the members, as we try to sort through what to do about how to structure health care services. You are involved in an important industry that provides health care services. As you look at it from a health perspective for this country, how important is it that we adopt this Federal law?

Mr. VAGELOS. Well, as you all know, and as many people have mentioned, this is a real health hazard. It is a terrible thing for people who have—who come down with lung cancer or cardiovascular disease, and probably cardiovascular disease is more common as an after-effect of smoking than even lung cancer or pulmonary problems. It is an enormous health problem that would cost us essentially nothing to get rid of. For those people who do not smoke to be exposed to this kind of a health hazard is a terrible thing, as we heard from the children. So, both from the point of view of the health hazard to the people of the United States who would be effected, and the costs of the health hazard; because, if we look at different aspects of the Health Security Act and their costs, one could balance what would happen if people stopped smoking in the United States, and see what an enormous impact that would have on our health care costs. So, I think it goes without saying that it is something that medically and economically it is a critical thing to do. We are strongly in favor of it.

Mr. WAXMAN. Whether we are going to ask businesses, or mandate them to cover their employees, or try to just make it more af-

fordable, any health insurance reform that we adopt is going to cost a lot of money. Here is a proposal that will cost relatively little if nothing and will have enormous benefits.

Ms. CARTER, you indicated that in these shopping centers you need a law because, otherwise, in the various establishments, they can make different decisions. Why should we have a law establishing no smoking policy throughout?

Ms. CARTER. If we could control the individual leased premises and tell them that they could not have smoking, we would do that; but they pay us rent, similar to what they do in office buildings, and similar to what they do with the Rouse Company. They are free to make their own decisions there. We can only control that over which we have jurisdiction, and we do not have jurisdiction in there. They will not do it voluntarily. It would be nice if they did, and we would not have to be here, but they will not. That is why we are here.

Mr. WAXMAN. Mr. DeVito, why can't people do this voluntarily if they wanted to? Why couldn't there be some contractual agreement between them? You have big malls and places where you have got a lot of tenants. Couldn't you just say to them, if you are going to open up an establishment, we insist on that?

Mr. DEVITO. I do not think so. I would not have the guts to do that. I mean, we did say that the area that we controlled, we did not care what our competitors did, we were not going to have smoking. Once the company understood that it was a health hazard, we could not any longer let it go on in the space that we controlled. In the individual tenant spaces, we are in a very competitive business with other malls and wherever we are. So, there it would be very very hard to incorporate within the lease a provision that would prohibit smoking. I think this is one of the principal problems with office buildings. There is such a competitive world for the space, that we simply could not do justice to our shareholders by taking that on ourselves, so we need this to help us make our malls totally smoke-free.

Mr. WAXMAN. Well, I appreciate the testimony. My time has run out. What you are all saying to us for various reasons is business wants a level playing field. You want the rules spelled out so that, if you are in the same business, you are not at a competitive disadvantage and, if you are in a business where you are running an establishment, you can have a requirement that everybody in that establishment follow those same rules.

Mr. Hastert.

Mr. HASTERT. Thank you, Mr. Chairman. I appreciate you being here today. It is interesting to see the representative of Merck, which is a large pharmaceutical company, I have heard some people on this panel from time to time malign you and your industry.

Mr. VAGELOS. So have I.

Mr. HASTERT. So, it is interesting that you are here on a voluntary basis testifying on this issue today. Basically it comes down to a decision that you made for your company. It was a business decision, based on good business logic. The reason you made that was because you thought, number one, it probably was best for your employees, I think; number two, it kept your health care costs down; is that correct?

Mr. VAGELOS. Absolutely. All three.

Mr. HASTERT. That was a business decision you made, right? Now, do you think it is good for Government to decide business policy for you or any other company in this country? Do you think that is a thing that we ought to be doing, having the Federal Government decide what is good health care policy for you, or having you decide yourself?

Mr. VAGELOS. Yes. Well, I think, if it were strictly a business decision, I think we would prefer to do it on our own. I think, in this instance, it is a health decision. I think health care policy is important and does involve Government and requires Government because it affects all people.

Mr. HASTERT. So, then you would endorse a Government decision to come in, because it is a health care issue then, to regulate a business' health care policy? Do you think that is a good policy?

Mr. VAGELOS. We are a heavily regulated industry.

Mr. HASTERT. You are looking for more regulations? Is that right?

Mr. VAGELOS. No. We are not looking for more regulations—

Mr. HASTERT. Oh.

Mr. VAGELOS [continuing]. —In many areas; but, in one that relates to public health, we believe that this would be a very useful Government intervention.

Mr. HASTERT. Good. I am glad we have you on record for that.

The young lady, Ms. Jordan, from Southern California Edison. Again, that was a company policy that you made yourselves, right?

Ms. JORDAN. Yes. Correct.

Mr. HASTERT. You think it is a good decision for your employees not to smoke. A lot of companies are doing that. They are looking to hold down our costs; how can we hold down health care costs. They have actively made those decisions across this country—

Ms. JORDAN. That is correct.

Mr. HASTERT [continuing]. —Your company being one of them. Was that a business decision you made? I mean, was that an internal decision that you have made for those purposes?

Ms. JORDAN. It was an internal decision, yes.

Mr. HASTERT. The bottomline was it is probably good health care policy, but it is also cost-effective; is that right?

Ms. JORDAN. That is correct.

Mr. HASTERT. You have made that of your own free will?

Ms. JORDAN. That is correct.

Mr. HASTERT. The free market decision?

Ms. JORDAN. Yes.

Mr. HASTERT. You think then it is good Government policy that we impose that decision on everybody?

Ms. JORDAN. Absolutely. I think it is excellent public health policy. As soon as we had evidence that passive smoking has an affect on the public's health, then our responsibility is to have a public policy with regard to public health, just as we have public policies for other issues that are public health issues.

Mr. HASTERT. I look at energy as well, and try to work through those public policies.

Ms. Carter, your stores are—it is a shopping mall, right?

Ms. CARTER. I represent only one of the five.

Mr. HASTERT. OK. Are these closed shopping malls?

Ms. CARTER. Yes, they are.

Mr. HASTERT. So, you not only control the stores themselves, but you control the premises in front of the stores and the entrances and I am sure that you have security that does that, right?

Ms. CARTER. Yes. We do not control the internal areas of the stores. That is under the control of the individual tenants.

Mr. HASTERT. It is also then against policy to have anybody smoking inside those premises too, right?

Ms. CARTER. No, it is not.

Mr. HASTERT. Oh, it is not?

Ms. CARTER. It is up to them. We still do have stores and restaurants that have smoking, and that is the problem, off the issue.

Mr. HASTERT. So, what you cannot control of your tenants, you would like to have Federal law to control; is that correct?

Ms. CARTER. Well, we would not like that, but that seems to be the only way to get it done. We think that is your responsibility.

Mr. HASTERT. Our responsibility to control your tenants?

Ms. CARTER. No.

Mr. HASTERT. I beg your pardon?

Ms. CARTER. To set policy.

Mr. HASTERT. So that you do not have to control your tenants, Federal law can control your tenants. Is that what you are saying?

Ms. CARTER. We have done it in our malls. There are some malls who have not.

Mr. HASTERT. Oh. So, you do control the inside of your tenants' stores?

Ms. CARTER. We are controlling what we control. We do not control inside. We make suggestions. We are here to ask your assistance. Because we do not see it as anything other than a health issue. We did not do this until the EPA study came out. When the EPA study came out in 1993, it said—it presented facts which we have no basis to dispute, that secondhand smoke, ETS, is a class-A carcinogen, way up there with things that are Federally legislated that you cannot have in buildings any longer because they are class A carcinogens.

Mr. HASTERT. Now, let me set this straight. I do not smoke. I do not like cigarette smoke. I try to avoid it. But we are talking about national policy. What we are saying is, you control the environment. You control the entrance to the stores, the hallways, the entrance to the shopping center. You can do that. You have security people out there. It is a little different situation on a strip mall where everybody has open access. Shopkeepers then have to control their doorways and the sidewalks, and the premises in front of their stores. It is a little different situation.

Mr. WAXMAN. Mr. Hastert, the gentleman's time has expired.

Mr. HASTERT. I understand my time is up.

Mr. WAXMAN. No, no. You have taken your time. If you want to complete your sentence, go ahead.

Mr. HASTERT. No, that is fine.

Mr. WAXMAN. OK. Good. Mr. Cooper.

Mr. COOPER. Thank you, Mr. Chairman. I appreciate the expert testimony of the witnesses. I was touched by the previous panel of kids. I am having trouble understanding the dimensions of this bill.

If it is a public health problem, why then it would seem to me that duration and intensity of exposure would have a lot to do with it. I am sitting here asking myself, if it is such a public health problem, why do we stop abandoning it at public places? I also ask myself, it is such a public health problem, and McDonald's will ban it in company-owned stores, why franchisees are not asked to do the same thing? I ask myself some of the questions that Mr. Hastert was asking. If it is a public health problem and responsible businesses recognize the need to do this, why aren't more businesses doing this voluntarily? I do not have answers to these questions, but it does seem to me that they need to be asked and I need to understand answers. I do not know right now how many States have taken it on themselves to ban smoking within the State or how many municipalities have done it within the municipality.

I would be interested in learning more about the private business aspect. I was interested in the BOMA materials. I believe you said you do not want the lessors to have any policing responsibly. You want the lessees to do the work.

Mr. JULIN. That is correct.

Mr. COOPER. Why did you all come to that conclusion?

Mr. JULIN. We do not have control over a lessee's employees, nor do we seek that control. That control has to remain with the employer.

Mr. COOPER. It is your building that would burn down or be injured. If there were a fire it would be your quality of atmosphere that you would provide to your customers in the malls or the other places that you are constructing or building. It is interesting that you want other people to do the enforcement, but not the owners, not even as a backstop. You would not be in the enforcement loop, as I understand it. That would be entirely a lessee responsibility.

Mr. JULIN. An employer responsibility, correct.

Mr. COOPER. Is there any role for the owner in this?

Mr. JULIN. The role of the owner is to provide the most comfortable work space available to its tenants. We feel that, by virtue of removing smoking from the workplace, we go a long way to achieving that role—that goal.

Mr. COOPER. Is it—most leases I have seen have lots of provisions. Do you have provisions in your leases that smoking would be prohibited as a condition of leasing the space?

Mr. JULIN. We do control at the current time common areas—lobbies, elevators, restrooms, corridors. We do not control the tenants' space.

Mr. COOPER. You have the power—the legal power to make it a condition of renting space or leasing space.

Mr. JULIN. On an individual basis, yes, but that would not put us on the level playing field that we would all like to have.

Mr. COOPER. You could control it for all of your member companies for all of their spaces, and that would be a level playing field among all of those folks, if it was a condition of renting. There would be presumably some folks who do not belong to your association or some other space. Within the area that you control, you could make it completely uniform.

Mr. JULIN. No. I do not know how we could do that. BOMA supported the no smoking ban as a resolution of the organization back

in January of 1993. We do not have the ability to police our own owners and say to them you must comply with this. It really is a market condition thing from their standpoint, as well as the particular aspects of each particular building as to how effectively they can provide a safe, comfortable, good air quality environment.

Mr. COOPER. You put lots of conditions on leases. If they do not pay their rent, they are in trouble. If they do not provide a safe environment for their customers, they are not in trouble? If it really is a public health problem—it seems to me you want the Federal Government to do some things that you are unwilling perhaps to do yourselves. Maybe I am misunderstanding BOMA's position on this. I was just struck by that provision—saying, hey, take us out of it.

Mr. JULIN. Yes. We are looking to you to in effect take us out of it, if you will—to make it a universal health situation.

Mr. COOPER. So it is a Government responsibility, but not an owner responsibility?

Mr. JULIN. In this case, I—that is correct.

Mr. COOPER. The Government responsibility would include banning smoking in a tobacco shop?

Mr. JULIN. I will not speak to particular leases or lessees. I do not know the answer to that one. It depends on how you—

Mr. COOPER. If you read the legislation, all public spaces would be banned, including tobacco shops, where presumably people would be on notice that they are likely to encounter it.

Mr. JULIN. That transcends in the shopping centers, and we are representing office buildings.

Mr. COOPER. If I could ask just one more question? Presumably, even though an asthmatic child might be in a home and subjected to tobacco smoke for 8-10 hours a day, maybe 18, maybe 24 hours a day, we are going to do nothing about that situation?

Mr. JULIN. I do not see BOMA or any of us sitting here being able to help you with that. That is something that the Government has to take under advisement in developing H.R. 3434 and its passing, or any future passing from that.

Mr. COOPER. Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you, Mr. Cooper. Mr. Cooper, I am going to use my time to answer some of your points, because it seems to me that you seem to be straining for a reason not to be for this bill. You have raised a lot of issues that I would like to clarify in my own mind. You and I voted for acid rain control legislation, clean air laws, and environmental protection laws that put regulations on industries in this country because the public health was at stake. Now we have got the public health at stake even more immediately when people have to breathe in environmental tobacco smoke. Those kids that have asthma cannot even go into a restaurant or an amusement park in your State or mine because they are going to get an attack of somebody else's smoking.

Now, these people here represent businesses that are telling us they have got to have a level playing field. They have got to get the rules spelled out. They do not have the leverage. Those three kids do not have leverage to go and tell a manager of a restaurant, well, I am not going to come back here. That would be the free market, Mr. Hastert. The free market does not work for kids that

have asthma. The free market will not work for people who do not have any leverage.

We spelled out the rules in the Clean Air Act, because we wanted to put things in the proper perspective. Governments sometimes just have to act. It is a public policy reason. Now, no one is going to suggest that there ought to be prohibition of cigarette smoking, as much as it is a public health problem. No one is going to suggest that because it is unrealistic. We tried that with alcohol, and we know it does not make sense. People ought to have the right to smoke if they want to. It is their decision. It is sort of like we have a public policy against drunk driving, even though we allow people to drink alcohol, because we do not want them to hurt others.

We need a Federal public policy against secondhand smoke, because people do not want to have to involuntarily breathe someone else's smoke. I think that is the reason we are looking at this issue. We are looking at it from a Federal perspective because we have heard from retail establishments that tell us they need the rules, but, even if a city or a local area adopts a law, they are put at a competitive disadvantage and they want a law that will put the rules squarely out there so that people know what they are. I do not know how you all voted on airlines, but, when we voted and we were told all of these things were going to be unworkable, and we were going to have a revolution on our hands, people abided by it. People will forego smoking when it is going to hurt other people. I think a smoker, if they realized the three kids with asthma are going to maybe have to go to a hospital because they are being exposed to cigarette smoke, would certainly want to be courteous.

What we all know that is new from the Environmental Protection Agency in 1993, if that tobacco smoke is a class A carcinogen. It is a serious health hazard. It is not just an annoyance, it is a real threat. People who want to smoke, let them take it on, if they are willing to do it to themselves. They are not going to try to figure out what health care system ought to be available, because it is clearly going to have to be available for people who indulge in a habit, sometimes involuntarily. It is an addicting one, that causes the leading preventable—amount of preventable death and disease. That is their decision. They should not do it to others.

Mr. Vagelos, I want to set the record straight and tell you that I appreciate you being here. We have had disagreements on other issues and we are willing to discuss them. There is no reason you have to be on my side of everything all the time, or someone else's side. It is a tribute to your integrity that you are willing to come here and give us your views, whether it is the same as one member's or another's. I think that is important.

Mr. VAGELOS. I am glad to be here, because, in fact, we are speaking for things that we think are good for public health in the United States in both instances.

Mr. WAXMAN. We are all entitled to our views.

Do any of you want to comment on this issue? Why do we need a Federal law? Let the marketplace take care of it? Let people make decisions on their own? Would anyone want to jump in on that?

Mr. DEVITO. One thing on the office buildings that I think—we own a lot of office buildings, and we have not made our office build-

ings yet smoke-free, simply because the office building marketplace is in a tragic condition. Every major city has a 20-higher percent vacancy rate, and everybody is competing tooth and nail for tenants. It is simply would be impossible in that marketplace to try to impose new and untried rental provisions in our leases. I wanted to make that point with respect to office buildings. It is a very difficult job to do that in the current market place.

Mr. WAXMAN. Thank you very much.

Mr. Hastert, you said you wanted a second round? I wanted to give you an opportunity, if you have some questions?

Mr. HASTERT. Yes. I am concerned about that vote. If it is just a quorum call—

Mr. WAXMAN. It is a—

Mr. HASTERT. It says that it is an amendment.

Mr. WAXMAN. Well, it might have changed. That must have been the first call. Did anybody call over to the clerk room? I think that is just a first call. Anyway, if you would like to proceed while we find out?

Mr. HASTERT. I think the debate here is interesting. It is something that we have to look at in our health care debate as well. I will put on the record that I have been duly chastised by the chairman.

Mr. WAXMAN. No, no. I did not mean to chastise you.

Mr. HASTERT. I think there is an argument here. The gentleman is from I think, the BOMA. Do they want to impose rules and regulations on their tenants? Do they want to do that, or do they want somebody else to do it for them? It is clear in Mr. Julin's testimony that they would have the Federal Government impose restrictions on their tenants because they do not want to do it themselves. It is an easier way to go. But I think, if you are in business, you want to not have the Government impose on everything. I think you are concerned about clean air bills, too, and carpets. I understand the record of your industry. You would rather blame the carpet makers and the furniture makers about the air quality in your buildings than increase the ventilation systems. That has been an issue in this Congress. I can understand how you would like to push the responsibility over on somebody else.

There is an issue here of how we treat people. We need to have good public standards. We need to have health standards. Where are our individual responsibilities and where are our individual rights? Where is the balance? If you want the Federal Government to come in and start to dictate how you run your electric industry from top to bottom, that is fine. I am sure there is somebody in the Federal Government that would like to come in and make all of your decisions for you. Then you would not even have to have a chief executive officer, because the Government could run it for you. You cannot have it both ways.

If you want Government to make business decisions for you, business decisions that affect your bottomline, then fine. But then you have Government intervention in how you do business every day. I think that there is a responsibility. I think it is great that you take the responsibility in your shopping malls.

In your places, Mr. Julin, where you rent to tenants, you can say, "It ought to be smoke-free." I think that is a good decision. People

who want smoke-free environments are going to go there because they enjoy that. That is a decision you ought to be making and not the Federal Government doing your dirty work for you.

Ms. JORDAN. Mr. Hastert?

Mr. HASTERT. Yes, ma'am?

Ms. JORDAN. I do not mean to argue with you; but this has gone beyond a business decision. When I said about a public health issue, we have had many public health policies and regulations in this country to protect the public's health. We, as business, cannot impose—how shall I say, the kind of standard in public health across all businesses. Our meter readers and our customer service representatives have to go into these places in which there is air that is contaminated, just as these children do. That is a public health issue. I am really trying to distinguish that from a business decision.

As soon as the EPA found out in its study that this has a negative impact on the public's health, then I do believe it is good public policy and a requirement of the Congress and State legislatures to do something about protecting the public's health in regard to cigarette smoke. It is not something you can stop at the door. It is not something that—it does pollute the environment. I think that is the distinction we are making. We are not talking about business policy here.

Mr. HASTERT. Forty-eight States have made——

Mr. JULIN. Mr. Hastert? May I respond.

Mr. HASTERT. Excuse me. Let me respond to the lady. Forty-eight States have. They have smoking regulations and smoke-free areas to differing degrees. Forty-eight States have acted upon that.

Ms. JORDAN. It is my understanding in a lot of the Federal agencies, which is a voluntary agency, have not enacted smoke-free environments. That is in the Federal Government. So, I am pretty certain that we do not have it across the Nation in the way that we need to have it.

Mr. HASTERT. Whether you have it in 48 different States and they do it different ways, or you have the Federal Government coming on and saying this is the way it is going to be across the State for everybody.

I yield back my time.

Mr. JULIN. May I respond to Mr. Hastert?

Mr. WAXMAN. Sure.

Mr. JULIN. A couple of things, Mr. Hastert. First of all, the BOMA, Building Owners and Managers Association represents both single user owners and multiple owners, multiple user owners where we have buildings where we have multiple tenants. It is very difficult for those owners to control what goes on in the suites of their tenants. It is easier for a single corporate owner to control what does occur in his building. BOMA has been in the past degraded for being the cause, if you will, of asbestos problems, and any other air quality problems in their buildings. We are strictly after improving air quality in the building, by virtue of removing the source contaminants and not trying to dilute them. Cigarette smoke, secondhand smoke is now a class A carcinogen. It is easily removable in an office building by banning smoking in that building, and that is what we are after.

Mr. HASTERT. Then you ought to do it.

Mr. JULIN. We need your help in being able to impose that on everyone as a health policy for the country.

Mr. HASTERT. I think you are pushing it off on the Federal Government.

Mr. WAXMAN. Mr. Upton?

Mr. UPTON. Thank you, Mr. Chairman. I appreciate the testimony from this panel, as well as the last one too. I should state from the beginning, I am not a smoker. I really avoid cigarette smoke almost at all costs wherever I go. I supported Congressman Durbin's amendment a few years ago to make permanent the ban on smoking in airplanes. This bill though is an issue that, quite frankly, I have not focused on until really yesterday afternoon. I have been working on some other things. When I learned of particularly you, Ms. Carter, coming today and others from my district, I spent a little time on it.

I just want to go into a little bit of background. I know that Michigan does have a State law on smoking. I will just read it into the record here some of the things it does. It prohibits smoking in elevators, child care facilities in schools. After the first of next month, restaurants seating over 50 folks must designate at least 50 percent of the seating that is non-smoking. Restaurants seating under 50 must designate at least 25 percent as non-smoking. Non-smoking areas must be designated in State and local Government buildings, colleges, universities, auditoriums, arenas, theaters, museums, concert halls. In places consisting of single rooms, at least 50 percent of the interior must be designated as non-smoking. Now, it is my understanding that the State House has passed I believe in recent days, additional legislation. I have not talked to my State reps or to the Governor with regard to this. Can you just—though it has yet to pass in the State Senate—but, can you just relate for me on the record what—

Ms. CARTER. I cannot tell you exactly when it passed, but it has been within the last couple of weeks. I testified there as well. It bans smoking in all shopping centers in the State of Michigan, including food courts.

Mr. UPTON. So, that would include, as you talk about, the four malls that you are in essence in control of, you ban smoking in just the public areas—the walkways, the bathrooms? This new State law will ban it within the stores themselves?

Ms. CARTER. I do not believe so. I do not know that.

Mr. UPTON. Just in the public—I see someone nodding their head behind you. Just in the public areas? So, it will really expand what you have done to all your competitors?

Ms. CARTER. That is correct. We did it—and this goes back to Mr. Hastert's comments—we went beyond the business. We knew we could lose business with making the decision that we made; but we knew that class A carcinogens cause cancer, and cancer kills. You cannot ignore that. That is condoning killing, and we cannot do that.

Mr. UPTON. How was it that you came to the decision? I mean, from your response to Mr. Hastert with regard to seeing what the EPA study did, did you do any type of polls? Did you do any questionnaires as people were coming into malls? I say that because

last year—I am known as a pretty big Chicago Cub fan as well as a Tiger fan. I can remember going to a Cubs game last year. In fact, they had a questionnaire. Obviously, those in politics always like to look at questionnaires and see what people are asking. I could tell immediately, even though it was a 20 or 25 question questionnaire, there was one focus that they were really asking—one question, and that was smoking. I heard just recently that when I go to a Cubs game this year, that smoking is now banned at Wrigley Field, in the outside as well as—I mean, sitting in your seats outside. We do not have a dome, as you know, and just barely have lights. That was a question that I know that I am going to find out exactly what the questionnaire showed that in fact they banned it.

Did you all do anything like that of patrons coming into some of your malls?

Ms. CARTER. Some of the malls did. Some already had designated smoking areas. The questionnaires were done when we determined whether or not some of the areas of the malls would have designated smoking areas, as opposed to letting them—and I am talking about in the common areas, the public areas, not inside the lease premises that we get rent for.

I wish that everyone could do what you would like to see them do voluntarily. That would be desirable.

Mr. HASTERT. Would the gentleman yield for a second, please, for a response?

Mr. UPTON. Sure. I would be glad to.

Mr. HASTERT. I respect what you say. I am sure that you do not allow anybody to rent from you that would sell tobacco either, do you?

Ms. CARTER. We would not restrict that. That is up to them.

Mr. HASTERT. Well, but would you allow tobacco shops—

Ms. CARTER. Yes.

Mr. HASTERT [continuing]. —In your premises?

Ms. CARTER. We—

Mr. HASTERT. Well, tobacco kills. It causes cancer. So, you do not make that moral decision when you collect the rent?

Ms. CARTER. It is not up to us to make that decision. It is up to the person who buys the tobacco to make that decision for themselves. When it goes beyond themselves, it is different.

Mr. HASTERT. I think there are some responsibilities that we both share.

Mr. WAXMAN. Without objection, I would like to give the gentleman an additional minute.

Mr. UPTON. I do not represent Calhoun County where your malls are though, therefore, I have not been to a mall in Calhoun County, as I have got plenty of malls in Kalamazoo County and Berrien County where I am from. What has been the reaction, if any, from some of the folks at maybe Crossroads, or other places—a mall? Have you heard any reaction from some of the malls in Kalamazoo in terms of what you have done? Have other malls come and—

Ms. CARTER. Crossroads is smoke-free. It is one of the malls that is smoke-free. East Town Mall is smoke-free; Maple Hill Mall is smoke-free; and Southland Mall is smoke-free, again, public and common areas. Those are in the Kalamazoo area. Mine is the only

one in Battle Creek that is smoke-free. There is another mall that is probably 700,000 square feet, 2 miles from us, that we invited to participate that chose not to. The rationale was because, if there was not legislation, they did not feel they could enforce it if somebody smoked inside in the public and common areas.

What we have found is that when we point out to someone who is smoking, they are very considerate and very cooperative, and very understanding that it is a smoke-free area.

Mr. UPTON. At the point that you went in fact smoke-free, did any of the businesses know—did any of the businesses within the mall themselves complain? Did any of them detect a loss of business or any ramifications from the decision that was made?

Ms. CARTER. We received some complaints, but there has been nothing in the sales figures—we get sales figures every month—that is attributable to going smoke-free.

Mr. UPTON. Thank you.

Ms. CARTER. Thank you.

Mr. WAXMAN. Would the gentleman yield to me a minute?

Mr. UPTON. I think I am—

Mr. WAXMAN. You still have a few. We hear a lot from members on both sides of the aisle, but often from the Republican side that, before we regulate, we should do a risk assessment and a cost-benefit analysis. The Environmental Protection Agency tells us there is nothing that is a greater benefit than to reduce the risk of environmental tobacco smoke at virtually no cost by just asking people to refrain from smoking while they are in these public places.

We often hear from Republicans that we ought to work with business, and here you are all business people telling us that you want a Federal law on the subject. We are also told that we ought to let State and local Governments experiment. If they do something that works, and it is needed as a Federal policy, once it has been tried out, we ought to then move at the Federal level. We have got something that wherever it has been tried at the local level, people have accepted it and it has been successful and beneficial for everybody involved, especially the health of the people. I just wanted to make those points.

I thank the gentleman for yielding.

Mr. Cooper, do you want another round? I will recognize you for 5 minutes.

Mr. COOPER. I would appreciate the chance to respond to some of the chairman's comments. Because when you said you wanted to answer some of my questions, I was waiting to hear some answers, and I heard mainly a political rebuttal.

Mr. WAXMAN. I hope more than that.

Mr. COOPER. The chairman's interest and like for big Government solutions is well-known in a number of areas. The chairman, I believe, in the overall health care area, favors the single-payor approach as his first choice—the Government basically running the system. There are others of us in Congress who try to keep Government intrusion to an absolute minimum, recognizing that there is an appropriate Government role, but that Government coercion should usually be the last resort, not a first resort. This is still a free country, thank goodness. I was just trying to explore in my questioning some of the public health ramifications. We are genu-

inely interested in limiting the exposure of asthmatic children to environmental tobacco smoke, passive smoking. I was interested in exploring the dimensions of your pending legislation on asthmatic kids, whether they happen to be at a fast-food restaurant, in a public shopping mall, or at home.

I was also interested in exploring the dimensions of some other things. You brought up the Clean Air Act. You mentioned acid rain. In those areas and in so many areas, I have been interested in market-based solutions to problems, trying to make our markets work as effectively as possible, primarily on a voluntary basis whenever possible, to make things work better for us all.

In the emissions trading section of acid rain, I was very pleased with our ability to work together there to try to reduce acid rain emissions. That bill is a classic example, of how the public may have misunderstood some of the public health consequences. Very few, if any, Americans have ever died or had their health injured as a result of acid rain. There are other parts of that bill that were far more impacting on human health—urban smog, toxic gasses, but areas of the legislation that really received much less public attention, because they did not quite have the code words in the media. They did not quite have the public relations behind them to get the public attention, even though, as a human health threat, they were considerably more significant.

Still today, the Clean Air Act is oftentimes referred to as kind of acid rain bill when that, in many ways, as far as human health is concerned, was the least significant title of the bill. The Federal Government in that case, as in so many cases, spent a ton of money. We spent almost a billion dollars on the NAPAP Study. Congress legislated before that study had even completed its work a billion dollars, 10 years of legitimate scientific research, and we went ahead and basically threw the study out the window before it was even completed by going ahead and legislating without anything but their preliminary conclusions.

What I think most members are interested in are cost-effective solutions to problems, helping people who need help keeping Government to a minimum, keeping Government coercion as a last resort, once we have tried everything else. I just was seeking specific answers to specific questions. I worry that some folks have intentions not just to reduce human exposure, but to put certain folks in America out of business who have been in business, whether we like it or not, for 4 or 500 years. Those folks have a more legitimate claim than to be treated—

Mr. WAXMAN. Will the gentleman yield to me?

Mr. COOPER. I would be delighted to.

Mr. WAXMAN. I certainly hope you did not take offense at my comments, because I certainly did not mean it in any personal way. I was trying to argue the public policy reasons why you ought to be looking seriously at this legislation. The acid rain issue, as you know, I cannot understand your argument about that at all. I mean, you did pose legislation and did support legislation that imposed a requirement on the industries of this country that pollute and cause acid rain to put in the money to do it. You try to do it in a market-based way. If you can come up with a market-based

way that will protect the health of people who go into public places, God bless you, I will be with you, but I do not know how to do it.

If you want to know the cost-benefit——

Mr. COOPER. Is that a commitment, Mr. Chairman?

Mr. WAXMAN. What is that?

Mr. COOPER. Is that a commitment, Mr. Chairman?

Mr. WAXMAN. I——

Mr. COOPER. You will be with me if we come up with a market-based solution?

Mr. WAXMAN. Absolutely. I am open to this.

Mr. COOPER. OK.

Mr. WAXMAN. I just want to point out that the preliminary EPA analysis concludes that compliance with this law will cost less than \$1 billion a year. For this investment, each year the Nation will save 38,000 to 108,000 lives valued conservatively at \$177 billion to \$513 billion. This estimate includes lives saved of non-smokers, smokers who quit and potential smokers who never start; \$6.5 billion to \$19 billion in medical costs and reductions in lost earnings; \$5 billion to \$10 billion in building maintenance, expenses. That is all from a \$1 billion expenditure. I think that is a pretty good deal from any perspective from those who want to get a market solution that gives the best bang for the buck.

Let me conclude by saying when you opened up your comments I am for big Government, I think that is a way of attacking me. I have not said that you are from a tobacco State and maybe that is why you are trying to look for a reason to be against this bill. I would think that would be an unfair comment—just as unfair as saying I am just for big Government.

Mr. COOPER. It is apparent that Tennessee is a tobacco State. I have thousands and thousands of folks in my district who have grown tobacco for many many years. None of them really want their kids to smoke, but they are concerned about an economic livelihood and making a living. They do worry about proposals that seem to systematically strangle them when they think they are growing a legal crop. I am worried about the public health consequences. I made no bones about the fact that smoking is hazardous to your health. Secondary smoke is hazardous to your health. Those, believe it or not, are even controversial statements from where I am from.

What is the best Government role, in terms of helping to educate the public, helping our people live healthier? Diet, exercise, so many other lifestyle changes are necessary and appropriate. What is the coercive role of the Government in helping people do better? That is really what this debate is all about. It is interesting to me that 15 minutes of smoke in a chain restaurant is apparently something worth Federal legislation on, but a day, a week, a month, a year—years of smoke in our homes is apparently not something we are interested in doing anything about. So, I just want to understand where the break point is here.

I respect the chairman's leadership on health care issues. I think you are advancing the ball. I think there are legitimate public policy disagreements in this area, as in many other areas. Let's help understand the pending legislation, its dimensions, its intentions, and let's see whether we can get a sufficient number of votes.

Mr. WAXMAN. I thank the gentleman for his comments. I take it in the most constructive way possible. I would look forward to having you talk to me further, if that would be helpful, or evaluating these arguments, as I evaluate the other arguments that are to be made as well. We do not want to cause people to lose their jobs. I am sensitive about that as well. I am not going to say as much as you, but, certainly I am sensitive to people in the tobacco industry losing their jobs. Perhaps we can figure out a good policy for them.

This is another issue that seems to me goes beyond just jobs. It is question of those three kids who were here this morning and other kids, and everybody else who is now breathing in something that we did not realize was as harmful as we now understand it to be. I want to work with you. I have a high regard for you, and I want to work with you.

I thank this panel very much for your testimony. I want to work with the American business as well.

The next panel of witnesses represent the medical world. I would like to call forward Mr. Randolph Smoak from the American Medical Association; Mr. Peter Carter, Tennessee Coalition on Smoking or Health; Mr. Richard Tooker, chief medical officer, Kalamazoo County, Mich.; Mr. John Hall, assistant vice president, fire analysis and research, National Fire Protection Association; Rudy Cole, Restaurants for a Sensible Voluntary Policy, former executive director, Beverly Hills Restaurant Association; W.W. Naylor, president, American Restaurant Services, Inc., and past president of the California Restaurant Association; and Mr. Chris Coggins, principal scientist, board certified toxicologist, R.J. Reynolds Tobacco Company.

I hope we have enough seats for everybody. We want to welcome you to our hearing today. We have your prepared statements, and they are going to all be in the record. What we would like to ask each of you to do is to limit your oral presentation to no more than 5 minutes.

I wonder if we could close the door in the back so we might be able to hear the witnesses? Why don't we start with Mr. Smoak?

STATEMENTS OF RANDOLPH D. SMOAK, JR., AMERICAN MEDICAL ASSOCIATION; PETER W. CARTER, TENNESSEE COALITION ON SMOKING OR HEALTH; RICHARD M. TOOKER, CHIEF MEDICAL OFFICER, KALAMAZOO COUNTY, MICH.; JOHN R. HALL, JR., ASSISTANT VICE PRESIDENT, NATIONAL FIRE PROTECTION ASSOCIATION; RUDY COLE, RESTAURANTS FOR SENSIBLE VOLUNTARY POLICIES, W.W. NAYLOR, PRESIDENT, AMERICAN RESTAURANT SERVICES, INC.; CHRIS COGGINS, PRINCIPAL SCIENTIST, R.J. REYNOLDS TOBACCO CO.; AND JOHN F. BANZHAF III, EXECUTIVE DIRECTOR, ACTION ON SMOKING AND HEALTH

Mr. SMOAK. Mr. Chairman, and members of the subcommittee, my name is Randolph Smoak, Jr., and I am a general surgeon from Orangeburg, SC. I am a member of the Board of Trustees of the American Medical Association. On behalf of the AMA, I am pleased to have this opportunity to express our views about H.R. 3434, and the significant adverse health effects of environmental tobacco

smoke or ETS. The AMA represents the physicians of this country who care for the patients at risk from disease and premature death due to the effects of tobacco use. Too many of our patients are ill due to ETS.

Speaking for physicians and their patients, the public health aspects of protection from ETS cannot be emphasized too strongly. The American people stand to benefit immeasurably by reducing the pervasiveness of this hazard. The AMA is pleased to support H.R. 3434. We note that it has been endorsed by a wide range of health and consumer groups, including the Heart Association, the Lung Association, Cancer Society, the Academy of Pediatrics, the Consumer Federation of America, the National PTA, and significantly, the Building Owners and Managers Association.

The AMA is pleased to add its voice to these supporters of H.R. 3434. Moreover, we agree with the characterization of secondhand smoke in an editorial in the Sunday, November the 7th, 1993 New York Times, as "a cough-provoking, tears-evoking nuisance." We agree with the testimony of the six United States' Surgeons General, represented in every administration since that of President Nixon, who took the unprecedented step of appearing before this subcommittee last month, each one testifying that the evidence linking ETS to lung cancer and other illnesses is overwhelming.

We agree with the statement of Chairman Waxman that "smokers do not have the right to jeopardize the health of non-smokers, particularly children." Exposure to ETS brought about when non-smokers inhale thousands of chemicals during passive smoking, may kill as many as 50,000 Americans annually. This means that passive smoking is the third leading cause of premature death in the United States, exceeded only by direct smoking and alcohol. In addition, the ETS imposed upon children causes 150,000 to 300,000 cases of bronchitis and pneumonia each year and worsens asthma in up to 1 million children on an annual basis.

The EPA report released in January of 1993 concluded that ETS first is causally associated with lung cancer in non-smoking adults and should be classified as a Group A carcinogen, and, second, produces an increased risk of development of acute lower respiratory infections, middle-ear infections, asthma, and respiratory irritation in children exposed in the home. The AMA strongly supports the findings of the EPA.

The presence of carcinogens in ETS should not be in question, nor should it be surprising to anyone that such chemicals are actually abundant in ETS. Indeed ETS contains a higher concentration of some carcinogens than mainstream smoke itself. The tobacco industry continues to deny a relationship between smoking and ill health of any kind. We disagree. Our experience in treating the deadly result of tobacco smoke cannot be denied. Tobacco use kills up to 470,000 Americans each year—that is direct and passive smoking combined. Tobacco is the only consumer product that kills when used as intended by the manufacturer. Tobacco is lethal, not only to individuals who use it directly, but also to those who have not assumed its risk. Because the EPA report strengthened the data on the adverse health consequences of smoking and broadened the hazard to include the non-smoking majority of the population, the tobacco industry and its allies continue to oppose it.

I will conclude simply by saying that the public will be well-served by continued education about ETS and action to protect it from this health hazard. Removing the tobacco smoke from the environment will save lives and reduce health care costs, goals that the AMA and its member physicians strongly support. I might add that a number of State medical societies, as well as the AMA, have voiced support for H.R. 3434.

In the January 18th, 1994 letter to Representative Waxman, for instance, the Texas Medical Association expressed its full support for the bill. The AMA agrees with the Texas Medical Association, and we believe the time to act is now.

This ends my formal statement. If I may, I would ask your indulgence for just a moment for several personal observations from my very own practice. Case in point. A physician/surgeon friend of mine in my small community who has been a heavy smoker had a heart attack, and subsequently had to have a coronary bypass, and was found to have a small cancer in the lung, less than a dime in size, which was removed. Unfortunately, a year later, he is dead of cancer of the lung. Second, just in recent months, I will cite these several cases. A 40 year-old man who presents with an illness of several months, cancer, diagnosed, he is dead. Last, a 65 year-old man, who had worked hard all of his life, who saved up all of the things he wanted to do, and had to have a career change at age 50 because of the effects of tobacco over many years, since age 15, he did accomplish that. He recently coughed up blood. I went through an examination with him, to diagnostic studies. With his whole family present, I am sitting there, his wife, when I tell them that he is inoperable, probably incurable, and perhaps just 1 year of life, maybe slightly more, his wife is panic-stricken, his children are numb, and he is sitting there with tears running down his cheeks saying I wish I could have stopped 15 years ago when you advised me to.

Mr. Chairman, 50 years ago perhaps we did not have the information to say what a deadly effect tobacco is. Let's do not wait 50 more years to get all the data that we possibly could gather to say that ETS will do the same to your constituents and our patients.

[The prepared statement of Mr. Smoak follows:]

STATEMENT
of the
American Medical Association
to the
HEALTH AND ENVIRONMENT SUBCOMMITTEE
HOUSE COMMITTEE ON ENERGY AND COMMERCE

Presented by Randolph D. Smoak, Jr., MD

RE: H.R. 3434, The "Smoke-Free Environment Act of 1993";
Adverse Health Effects of Exposure to Environmental Tobacco Smoke

March 17, 1994

Mr. Chairman and Members of the Subcommittee:

My name is Randolph D. Smoak, Jr., MD, and I am a general surgeon from Orangeburg, South Carolina. I am a member of the Board of Trustees of the American Medical Association (AMA). Accompanying me today is Jeffery M. Stokols, JD, of the AMA's Division of Federal Legislation.

On behalf of the AMA, I am pleased to have this opportunity to express our views about H.R. 3434 and the significant adverse health effects of environmental tobacco smoke (ETS), commonly known as "passive smoking." The AMA represents the physicians of this country who care for the patients at risk for disease and premature death from the effects of tobacco use. Too many of our patients are ill due to ETS. In speaking for physicians and their patients, the public health aspects of protection from ETS cannot be emphasized too strongly. The American people stand to benefit immeasurably by reducing the pervasiveness of this hazard.

The AMA is pleased to support H.R. 3434, the "Smoke-Free Environment Act of 1993," a bill which would implement the policy of the Environmental Protection Agency (EPA) recommending that "every company have a smoking policy that effectively protects nonsmokers from involuntary exposure to tobacco smoke." H.R. 3434 would require the "responsible entity" (the owner or lessee) of a "public facility" (any nonresidential building regularly entered by 10 or more individuals at least one day per week) to adopt an ETS policy that either: 1) bans smoking inside the building, or 2) restricts smoking to "specially designated smoking areas" (separately ventilated rooms). In addition, H.R. 3434 would prohibit smoking "on facility property within the immediate vicinity of the entrance to the facility," as well as requiring the posting of "a clear and prominent notice of the smoking prohibition in appropriate and visible locations at the public facility." H.R. 3434 would provide for a fine of up to \$5,000 per day for its violation.

We note that H.R. 3434 has been endorsed by a wide range of health and consumer groups, including the American Heart Association, the American Lung Association, the American Cancer Society, the American Academy of Pediatrics, the Consumer Federation of America, the National Parents and Teachers Association, and, significantly, the Building Owners and Managers Association (the group which represents the commercial office building industry and whose members own or manage more than five billion square feet of office space). The AMA is pleased to add its voice to these supporters of H.R. 3434. Moreover, we agree with the characterization of secondhand smoke (ETS) in an editorial in the Sunday, November 7, 1993 New York Times as "a cough-provoking, tears-evoking nuisance." We agree with the testimony of the six United States Surgeons General--representing every Administration since that of President Richard Nixon--who took the unprecedented step of appearing before this Subcommittee last month, each one testifying that the evidence linking ETS to lung cancer and other illnesses is "overwhelming." We agree with the statement of Representative Waxman,

Chairman of this Subcommittee and sponsor of H.R. 3434, that "smokers do not have the right to jeopardize the health of nonsmokers, particularly children."

The need to take action to limit exposure to ETS is overwhelming. Exposure to ETS, brought about when nonsmokers inhale thousands of chemicals during "passive smoking," may kill as many as 50,000 Americans annually. It is estimated that about 35,000 of these deaths are from heart disease, 3,000 from lung cancer, and about 12,000 from other cancers. This means that "**passive smoking**" is **the third leading cause of premature death in the United States**, exceeded only by direct smoking and alcohol. For example, the ETS cancer mortality alone is higher than the total cancer mortality figures from all the other environmental hazards regulated by the EPA and other government agencies, combined! These include substances such as all regulated outdoor air pollutants, asbestos, benzene, arsenic, radiation, pesticides, active and inactive hazardous wastes, all workplace chemicals, and all other consumer products. In addition, ETS imposed upon children causes 150,000 to 300,000 cases of bronchitis and pneumonia each year, and worsens asthma in up to 1 million children annually.

The EPA document, "Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders" (EPA/600/6-90/006B), released in January of 1993, addressed some of the major health effects of ETS. This report concluded that ETS: 1) is causally associated with lung cancer in nonsmoking adults and should be classified as a Group A carcinogen, with approximately 3,000 excess deaths yearly, and 2) produces an increased risk of development of acute lower-respiratory infections, middle ear effusions, asthma, and respiratory irritation in children exposed in the home. The AMA strongly concurs with the EPA findings. We believe that ETS should be classified as a human carcinogen, and strongly support the findings of the EPA.

THE RISK OF LUNG CANCER AMONG NONSMOKERS DUE TO ETS

At least three major reviews have been published regarding the health effects of ETS. These reports identified and analyzed many of the studies under review which served as the basis for the EPA document. The 1986 Surgeon General's report, a 1986 review by the National Academy of Sciences, and a review paper published in Britain in the same year all linked ETS to respiratory illnesses in children and to lung cancer in nonsmokers. Since those studies were published, other reports have been published that continue to affirm the carcinogenicity of ETS. The National Institute of Occupational Safety and Health (NIOSH) recently reviewed the data concerning ETS in its Current Intelligence Bulletin #54 (June 1991) and concluded that ETS is potentially carcinogenic and that **"simply eliminating tobacco use from the workplace" is the best method of dealing with this hazard** (emphasis added). We concur with these findings as well, and believe that the data is clear and overwhelmingly convincing.

The presence of carcinogens in ETS should not be in question, nor should it be surprising that such chemicals are abundant in ETS. Indeed, there is evidence that ETS is even more toxic than mainstream tobacco smoke. Mainstream tobacco smoke contains over 4,000 identified substances, nearly four dozen of which are carcinogenic. ETS, composed of sidestream smoke from the smoldering cigarette, exhaled mainstream smoke, and other components which escape from the cigarette during smoking, also contains many of these toxic and carcinogenic substances. Still other components in ETS are known to be either co-carcinogenic tumor initiators or tumor accelerants. For example, ETS contains a higher concentration of some carcinogens than mainstream smoke, including the volatile amines and the nitrosamines. In addition, ETS contains benzene, tobacco-specific nitrosamines, and radioactive decay products such as Polonium-210.

Theories of carcinogenesis generally involve repeated exposure over time to an irritant, chemical toxin, or radioactive particle leading to abnormal tissue growth that we identify as cancer. It is not surprising that ETS has been given a "Class A" carcinogenicity label, based upon what is known about the dose and time factors involved in smoke-induced carcinogenesis. Absorption of tobacco-specific smoke constituents such as nicotine and other biological markers has been measured sufficiently in ETS-exposed persons to conclude that such exposure is ubiquitous, and that the effects of the toxins in smoke do occur in nonsmokers. In a study reported in the New England Journal of Medicine, metabolic elements known to be carcinogens were found in healthy, non-smoking men exposed to ETS under controlled conditions, proving that non-smokers absorb and metabolize the cancer-causing toxins in ETS.

RESPIRATORY DISEASE IN ETS-EXPOSED CHILDREN

Physicians who care for children have long been aware of the clinical evidence linking parental smoking with a variety of respiratory diseases in children. We now teach medical students and resident physicians to inquire about exposure to cigarette smoke in cases of recurrent ear effusions, bronchitis, pneumonia, and asthma. Many studies have confirmed the relationship between ETS and these illnesses in children. Exposure to ETS has been linked with increased emergency room utilization by children for respiratory complaints, increased hospitalizations due to these illnesses, more school absences, and increased health care costs for smoke-exposed children. These problems are especially troublesome in very young children and those born prematurely or with low birthweight, many of whom may have been exposed to the toxins in tobacco in utero. Further confirmation of this was published in the February 23, 1994 issue of the Journal of the American Medical Association. A Canadian researcher found that cotinine is transmitted to unborn children exposed through their mothers to passive smoke.

The EPA document addresses these issues and the literature concerning childhood illness due to ETS exposure. As is the case with the lung cancer section of the EPA document, there is biologic plausibility in the assumptions made and in the conclusions reached. There are demonstrable measures of allergy (increased IgE levels among smoke-exposed children) and decreased pulmonary function in the at-risk group. Middle ear disease may be mediated by decreased mucociliary function in the Eustachian tubes similar to the effect of smoke on the lungs, or perhaps the inflammatory effect of smoke constituents.

Studies that implicate cigarette smoke exposure as a causal factor in asthma are clinically compelling. There is an increased utilization of medical care among smoke-exposed children and, as with the other illnesses studied, there exists a dose-response relationship. Airway hyper-reactivity, inflammatory changes in the airways, and the heightened allergic response by exposed children may all be implicated in this problem. Again, up to a million cases of asthma each year may be exacerbated by exposure to tobacco smoke, and as many as 20,000 new cases of the disease may be initiated annually by ETS exposure.

PUBLIC POLICY IMPLICATIONS

Finally, as advocates for patients, we must comment briefly upon what we believe are important public policy issues at stake. The public perceives risk differently when it recognizes the difference between an assumed risk and one which is imposed upon it, without the control or consent of those who may be affected. We believe that it is imperative that the public, physicians, employers, and public policymakers become educated about the problems posed by ETS. The costs to the nation in terms of human suffering and death are simply too great to be ignored. President Clinton could help this process greatly by signing an executive order making all federal buildings and facilities smoke free.

General public education to reduce direct smoking prevalence must also be pursued. Families with children and their physicians must clearly understand the risks of childhood exposure to ETS and act accordingly. The EPA document and the subsequent campaign developed by the Centers for Disease Control and Prevention on passive smoke exposure should have some effect in addressing this national problem by making it more personally meaningful.

Legislators and other public policymakers will undoubtedly continue to hear from groups who profess a "scientific" interest in the validity of this issue and who will attack it on the basis of the EPA's methodology and conclusions. The tobacco industry continues to deny a relationship between smoking and ill health of any kind. We disagree. Our experience in treating the deadly results of tobacco smoke cannot be denied. We believe that the tobacco industry fears that public awareness of the risks imposed by ETS exposure will make smoking less socially acceptable, lead to an increase in smoke-free workplaces and other public venues, and will reduce its revenues as a consequence.

We believe that the tobacco industry fears the continued erosion of its market in this country and as well, the impact of the EPA report on advertising, marketing, and litigation. Sentiment against the use of cartoon figures in cigarette advertisements and the findings in the Cipollone case by the US Supreme Court (Cipollone v. Liggett Group, Inc., 112 S.Ct. 2608 (1992)), which expanded the potential liability of tobacco manufacturers, have damaged the industry. Tobacco use kills up to 470,000 Americans each year (direct and passive smoking combined); tobacco is the only consumer product that kills when used as intended by the manufacturer! **Tobacco is lethal, not only to individuals who use it directly, but also to those who have not assumed its risks.** Because the EPA report strengthens the data on the adverse health consequences of smoking and broadens the hazard to include the nonsmoking majority of the population, the tobacco industry and its allies will

continue to oppose it, as evidenced by their suit filed last year against the EPA and, more recently, against the City of San Francisco. The AMA strongly supports the EPA, as well as the protection of the public from ETS by regulatory and legislative means.

CONCLUSION

The AMA strongly supported the adoption of the EPA report last year, and we strongly support H.R. 3434 now as an effective measure to implement its findings. The AMA believes that the public will be well served by continued education about ETS and action to protect it from this health hazard. We note that the State of Maryland Commissioner of Labor and Industry has proposed regulations to prohibit smoking in enclosed workplaces (except for separately ventilated smoking areas), as recommended by the Maryland Occupational Safety and Health Advisory Board. Removing tobacco smoke from the environment will save lives and reduce health care costs--goals that the AMA and its member physicians strongly support. In this regard, the AMA has developed model state legislation to prohibit smoking in hospitals, nursing homes, and public elementary or secondary schools, as well as other public places, which we will be pleased to provide to this Subcommittee upon request.

We might add that a number of state medical societies, as well as the AMA, have voiced support for H.R. 3434. In a January 18, 1994 letter to Representative Waxman, for instance, the Texas Medical Association expressed its "full support" for the bill, relating that "smoke stinks and is irritating to 70 to 80% of the population," that "tobacco use and exposure to tobacco smoke remains the single most important preventable cause of death in our society," and that "this issue is not a smokers right issue, but a public health issue." We agree with the Texas Medical Association on all counts, and we believe that the time to act is now!

Mr. WAXMAN. Thank you very much, Mr. Smoak.
Mr. Carter.

STATEMENT OF PETER W. CARTER

Mr. CARTER. Being from Tennessee, I would perhaps request an extra 30-second allotment time, as I think my report may run over.

My name is Peter W. Carter, M.D. I am a cancer specialist. I am here to speak in favor of the Smoke-Free Act of 1993. I am in practice in Knoxville, Tenn. and for many years have treated many many patients with malignant and non-malignant diseases caused by tobacco. I am also director of the Coalition on Smoking or Health in Knox County, and I, along with my coalition partners across the State have worked to try and educate the public about the significant health problems from secondhand, as well as first-hand tobacco.

Since 1964, medical evidence has continued to implicate tobacco in an ever-increasing number of diseases. For 10 years, evidence linking environmental tobacco smoke to disease in non-smokers has been reported in reputable, well-respected, peer-reviewed journals. With the appearance of the 1992 EPA report, public consciousness has been focused significantly.

My own awareness of the issue led me to focus on how it has affected my family, friends, and my patients. I have written 2 sets of letters to some 45 Knoxville area restaurants educating them about ETS and urging them to adopt a smoke-free policy. A limited number have done this, however, the majority say, we simply wish the Government would take care of this for us to carry all businesses uniformly.

I have lost count of the number of patients and friends who have related experiences at restaurants and other public places where they are forced to breathe cigarette smoke and suffer numerous ailments. I have a 3-year-old daughter, and a 4-month-old son, and each and every time we go out to eat I fear for their health, since frequently, virtually always, the non-smoking section is right next to the smoking area, with no separation. In fact, it is more realistic to say, in virtually all public places, there are simply smoking areas and secondhand smoking areas.

We realize now that, on numerous occasions, we have had to risk our own health in places where sometimes so many people smoke the air is as thick as a London Fog. You may well imagine my fear and concern for my patients, my family and my friends, given the fact that I am a cancer specialist and well aware of the significant problems caused by tobacco.

With the support of many groups in our State, some places have become voluntarily smoke-free in 1993. One would expect that, given our State government's interest in health care reform and the TENNCARE plant, they would welcome this. Regrettably, that does not appear to be the case since, even as I speak today, there are certain legislatures presenting bills in Nashville which would mandate a 25 percent smoking area in many of these same public places. When asked about this, the legislators will say, well, I think alcohol is the problem too, so why not treat both equally, or I know my constituents are against this bill, but I had to vote for it to help out my buddy in the House. One legislator presenting a pro-smok-

ing bill has suggested there may be benefits to promoting smoking in bars since, "we may knock off some potential drunk drivers with secondhand smoke."

In the 30 years since the first Surgeon General's report, our Federal Government has done next to nothing to achieve effective tobacco control. During that time, the tobacco cartel has continued to try and deny the problems caused by smoking, in terms of disease and death. We, of course, know better, since this year 460,000-some people will die because of tobacco-caused diseases. It is unbelievable, unconscionable, shameful and unacceptable that so little progress has been made after this many years. The dangers of secondhand smoke have been apparent for 10 years. The same individuals in the tobacco lobby contend the same problems with secondhand smoke is no cause of illness, as they did with first-hand smoke.

I will submit to you that the main motivating factor behind this tobacco industry propaganda is the desire to protect profits. They are the masters of deception and misinformation. They are followers of the dictum, if you tell a lie enough times, the people will begin to believe it to be the truth. I urge each member of this committee to realize that smoke-free legislation is an issue purely of public health. Do not be deceived by the phoney arguments of the tobacco industry. This issue had nothing—I repeat, nothing to do with so-called smokers' rights. It has nothing to do with the Constitution, the Bill of Rights, or personal freedom. The very term smoker itself has been misused. Nicotine addiction is not a fundamental personal characteristic, in the way that race, gender and nationality or disability are. Therefore, there is no fundamental right to smoke. Cigarette use cannot and must not be used as a means to define a class of individuals needing protection.

It further ought to be clear that no one is banning smoking. This is a misrepresentation and a formulated smoke-screen to cloud the decision making of the legislators and the opinion of the public. Smoke-free policy simply asks, if you smoke, please do not make others around you do so. I ask each of you to honestly consider all of the submitted testimony and the facts presented here and act responsibly and in the best interests of the American public. Decisive, progressive and meaningful action on tobacco control will help ensure that all of us, especially our children, will enjoy a tobacco-free and healthier 21st century. Thank you.

[Testimony resumes on p. 330.]

[The prepared statement of Mr. Peter Carter follows:]

**COALITION
ON SMOKING
OR HEALTH**

**WRITTEN TESTIMONY SUPPORTING
THE SMOKE-FREE ENVIRONMENT ACT OF 1993
PRESENTED TO THE CONGRESSIONAL SUBCOMMITTEE ON
HEALTH AND THE ENVIRONMENT**

**BY PETER W. CARTER, M.D.
MARCH 17, 1994**

As I noted at the beginning of my verbal testimony preceding this, I am a physician specializing in oncology/hematology. I am currently Board certified in internal medicine and the subspecialty of medical oncology. I graduated from medical school in 1983, and since completing training in oncology/hematology at Duke University Cancer Center in 1989 have been in private practice with Knoxville Hematology/Oncology Associates in Knoxville, Tennessee. It should be clear, therefore, that over the years I have seen many thousands of patients with innumerable malignant as well as nonmalignant diseases caused by tobacco. Much of this disease has been the result of primary tobacco exposure (chronic tobacco poisoning); however, with the increasing recognition of passive smoking or environmental tobacco smoke (ETS) and its adverse effects on people who do not smoke, I have become more aware of illness caused by this substance.

As I also previously mentioned, I am the Director of the Coalition on Smoking OR Health in Knox County. This coalition is an entirely voluntary organization and is the tri-agency alliance of the American Cancer Society, the American Heart Association and the American Lung Association. This group and its counterparts throughout the state include representatives from the Health Department, the Mayor's office, hospitals and other concerned groups. Our mission is to educate the public, especially the legislators and



AMERICAN LUNG ASSOCIATION
The Chestnut and the Olive



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policymakers, about the significant health effects caused by tobacco, from both firsthand use and passive smoking.

Since the initial 1964 Surgeon General's report on smoking appeared, the medical evidence implicating tobacco in an ever-increasing number of diseases has continued to accumulate. There have been around 50,000 medical/scientific papers published on the subject, and the evidence is undeniable and non-debatable. These data, along with the experience of thousands of physicians treating millions of individual patients with the diseases caused by chronic tobacco poisoning, make a case against tobacco which is irrefutable. For nearly ten years now, evidence linking ETS to disease in nonsmokers has appeared in reputable, well-respected, peer-reviewed journals. These journals include, among others, The Journal of the American Medical Association, The New England Journal of Medicine, The Journal of Public Health and The Journal of Epidemiology. As the subcommittee members are well aware, there have also been several reports from the Surgeon General's office on the subject of ETS, with one of the first being from President Reagan's Surgeon General, Dr. C. Everett Koop. With the appearance of the 1992 Environmental Protection Agency report on this problem the public consciousness on the issue has been raised significantly, and all the subcommittee members are well acquainted with the results of this report.

We are all familiar with the tobacco industry's opinion towards the EPA report, which has been forwarded by the Tobacco Institute, paid lobbyists and paid "researchers". They contend that the statistics are flawed and the data are questionable, thus making the overall conclusions of the report highly suspect. This attempt to cast doubt on the validity of this ETS study should

come as no surprise, since no one would expect the Tobacco Cartel to publicly accept findings which would implicate its product as a cause of disease among individuals who are exposed to it passively. To do so would potentially affect their profits and also increase their liability. It is important to remember that these individuals in the tobacco industry are the same ones who 30 years ago tried to deny tobacco as a cause of disease in people who smoke, and in fact they have continued to try to avoid and deny the health problems in the face of overwhelming evidence and experience. Even in 1994 there are persons allied with the Tobacco Cartel who will say with a straight face that cigarette smoking does not cause lung cancer. We should all recognize these efforts for what they are, an attempt to cast doubt -- even a small amount of doubt -- on the issue of tobacco and disease, in order to delay and forestall any efforts to control the product, thus protecting their profits.

The tobacco industry has a long history and a great amount of experience at presenting their arguments in a very clever, skillful way. Occasionally, upon initial review of some of these arguments in writing, even I have experienced brief glimmers of doubt until recognizing the source of the information, or until reputable, independent researchers point out the fallacy of their arguments. We should all realize that individuals working for the tobacco industry have become the absolute masters of deception and misinformation. I shall present several specific examples of their activities with regard to their strategy to prevent tobacco control measures such as smoke-free legislation.

My personal experience with the subject of tobacco and disease began in 1981, when I first began to see patients in medical school. My awareness .

about ETS was raised significantly with the 1992 EPA report. Ironically, it was only a few months before this that I began to adopt a much more "activist" approach toward tobacco control and disease prevention. When President Clinton was elected, health care reform became a much-discussed national issue. Around that time several articles were published in the Journal of the American Medical Association reviewing and updating the facts about tobacco and disease, and statistics such as the total number of deaths caused by this product. Interestingly, even as a cancer specialist I was not nearly so well informed about this issue as I should have been, and I was appalled at the enormity and scope of the epidemic of disease caused by chronic tobacco poisoning. I recognized also that if I -- as a highly trained cancer specialist in practice -- was not fully informed on these issues, then how could legislators or even the general public be informed? At that point I felt it was my duty to do everything possible to get this information out.

In November of 1992 I began writing a series of letters regarding tobacco to numerous individuals in our government including President-Elect Clinton and Hillary Rodham Clinton; the Surgeon General Designate Dr. Elders and several key staff members; our state's entire congressional delegation; and numerous other senators and representatives of the U.S. Congress. From that point on, I along with other individuals and groups became increasingly engaged in the campaign against tobacco in the hopes of preventing disease and saving lives as well as health care dollars. I will attempt to present specific experiences and activities in chronological order, beginning in late 1992 and extending to the present. I will refer to various medical papers, letters and newspaper accounts, and these "Items" are enclosed with this

testimony. It is my hope that all of the information presented will make a strong case in favor of the Smoke-Free Environment Act of 1993.

On Christmas Eve 1992, my wife and I and our 18-month-old daughter met a large number of friends to eat dinner at a local restaurant known as The Copper Cellar. We had asked to be seated in the "nonsmoking" section. It was soon after we ordered that five young people sitting at the table adjacent to us began to light up and proceeded to smoke cigarettes through the entire dinner. We complained bitterly to the waiters and the manager because of our discomfort and our concern for the health of our daughter. When asked why people should be smoking in the nonsmoking section, the explanation was that the smoking area was full and this was the only place where they could sit. Nothing was done about the problem and we suffered through our dinner as best we could. The following week I wrote a letter to the manager of the restaurant but received no response. We found out later that several of the managers and also the owner smoke.

It was quite ironic that within a few weeks after this the EPA released its report on secondhand smoke and I as well as many others became much more aware of how the above-noted experience in a public place was adversely affecting the health of each of us, especially our children.

Because of the above report on ETS, State Senator Albright and Representative Byrd formulated a "Clean Indoor Air Bill" for Tennessee and presented it to the legislature. At this point I became involved with campaigning in favor of this on behalf of my practice and the American Cancer Society, along with other individuals and groups across the state. Regrettably, this bill failed to pass because of the efforts of the tobacco

lobby; combined with the fact that the Speaker of the House in Nashville, Jimmy Naifeh, is strongly allied with the tobacco industry and has part ownership in a cigarette distribution business. Interestingly, the press also reported that the woman he was dating at the time was a lobbyist whose firm counted Philip Morris among its clients. The bill itself had been placed in a "hostile" committee, many of whose members smoke, and so its failure to get out of committee came as little surprise. One of the Nashville papers commented on the above issues, and the story is enclosed (Item 1). The writer refers to the importance of the bill and discusses the influence of House Speaker Naifeh. An excerpt reads, "But on Capitol Hill, Naifeh said, 'the days of smoke-filled meeting rooms and cigar-chomping lawmakers will not change. I think with Tennessee being the third largest tobacco-growing state in the country, the 50,000 families who rely on that industry might be concerned about that' (the bill), Naifeh said as he put his own half-smoked cigar between his lips." An editorial in the same paper remarked on the significant disdain for the public's health held by Mr. Naifeh and certain legislators. It should be noted that around this same time, an independent research group measured unacceptably high levels of Benzene (a known carcinogen) in the legislative buildings in Nashville (this is personal communication from Mr. Russ Petty in Memphis, Tennessee, a Coalition on Smoking OR Health member).

By February of 1993 I began efforts to educate local restaurants about the problem of ETS, and wrote a letter that was signed by all the partners in my group. A sample of this letter is enclosed as Item #2. The first set of letters went out to some 33 restaurants, and several others were sent in

early April. All totaled, between 40 and 45 businesses received the information. Along with this letter I sent endorsements from the following: the American Cancer Society, the American Heart Association and the American Lung Association; the local medical society; the Knox County Health Department; and Children's Hospital, Baptist Hospital, St. Mary's Hospital and the Fort Sanders Alliance (this includes Fort Sanders Regional Medical Center and Fort Sanders Park West Hospital), Items #3-11.

A majority of the restaurants did not respond to my letter by writing back; however, upon speaking with managers and owners over the next several months virtually all said they understand the importance of the issue but would prefer that the state or federal government simply pass a law to make all businesses smoke-free in a uniform fashion. They expressed concern over the possibility that if their establishment became smokeless, some people would simply go to their competitor down the street and they would lose money. It should be noted, however, that there is little reason for this concern. In other places around the country that have become smoke-free, or in instances where a citywide ordinance has been passed, there has been no significant decline in revenues for the restaurants; and in fact, some have reported an increase because many more people do not smoke and thus are more attracted by the smoke-free restaurants.

On April 16, 1993, a report on the above efforts came out in the Knoxville News-Sentinel, written by Richard Powellson (Item #12). On April 19, an editorial in the same paper commented on the failure of the Clean Indoor Air Bill (Item #13). Some of the reasons discussed (area highlighted) include the tobacco lobby, campaign donations and free cigarettes to

lawmakers. It should be mentioned that just prior to this, a statewide poll indicated that 84% of people in the state of Tennessee were in favor of some form of clean indoor air legislation.

The broadcast media in Knoxville became interested in this issue and I was afforded the opportunity to appear on a 30-minute talk show with a restaurant owner and a local legislator to better inform the public about ETS. The general response to all of these efforts was quite favorable, though there were some detractors such as those who wrote letters to the editor of the newspaper and so on; most of these individuals are tied to the tobacco industry in some fashion.

With all of the activities I undertook, the Knox County Division of the American Cancer Society in April, 1993, asked me to formally join its volunteer board of directors; and the State Division of the ACS suggested that we formally organize a coalition in Knox County. This was the beginning of the Coalition on Smoking OR Health in Knox County, to which I referred at the beginning of my testimony (this organization will be referred to in this document as simply "the Coalition"). Representatives from Heart, Lung and Cancer Societies, as well as the Assistant to Mayor Victor Ashe, a local legislator and a County Commissioner were present, among others. This initial meeting in June, 1993, was well received and was covered by the TV stations. It was held in one of the finest restaurants in Knoxville, The Orangery, and in addition to the fine cuisine a key reason it was selected was to symbolize to the owner the importance of the ETS issue as well as other tobacco-related problems.

Before describing the events which followed, I believe it is worthwhile

to digress in order to discuss some specific personal experiences with ETS that took place prior to the events above. This will help provide the reader with a clearer understanding of how certain experiences helped to bring about the activities which occurred in 1993 and are ongoing. These examples will illustrate the general nature of the problem, but it should be understood that these passive smoking episodes have been repeated over and over on countless occasions by my family as well as numerous friends and patients of mine.

In The Orangery itself, my wife and I were once at dinner with friends and thought we were in the nonsmoking area, but unfortunately this was not the case. Several young women at tables on either side of us began lighting up and did so repeatedly throughout our meal with no regard whatsoever for the fact that they were making us uncomfortable by forcing us to smoke along with them.

At T.G.I. Friday's, a very pleasant restaurant/bar establishment, we have tried to sit in the "no smoking section," but the problem is that it is just adjacent to the bar, so that once again when others smoke we are forced to do so as well. We have taken our daughter, now 2-1/2, and son, now 4 months old, out to family-type restaurants. We went to one of these, The Black-Eyed Pea, while my wife was pregnant with our younger child. We were seated in the nonsmoking section (I will abbreviate this as NSS from here on), and -- wouldn't you know it -- our table was right next to a 3-foot-high barrier "separating" us from the smoking area. Three people seated there, just to our side, each smoked numerous cigarettes, and of course the smoke drifted easily to us and everyone else. In fact, the owner even turned on the

ceiling fans, which served only to disseminate this toxic tobacco smoke throughout the entire restaurant so that everyone there would have an equal opportunity to be a passive smoker. As I said, this scenario has been repeated over and over again; and it is quite clear that, since only a few tables or a low wall separates people who smoke from those who don't, virtually all public places consist of a smoking section and a secondhand smoking section.

The above situation is of course far worse in bar-type establishments, where my wife and I have tried to go to enjoy live entertainment such as jazz bands. There are many of these businesses in Knoxville, particularly in a lively, eclectic area known as The Old City. In this Bourbon Street-type area, one such restaurant/jazz club, Manhattan's, will serve to illustrate an important point. About a year and a half before the EPA report, we went to this place to have a drink and listen to live music. About half of the area inside was for eating, and there was no designated NSS. There were so many people (most of them quite young) smoking cigarettes through the hour and a half we were there that the air was literally as thick as a London fog, as it is in virtually all such places we have visited. In spite of the fact that the music was quite good, about an hour and a half was all we could tolerate because of our burning, watering eyes, nasal congestion, sore throat, coughing and difficulty breathing. We returned home later that evening and for the next three days I had alternating sinus congestion and drainage, sore throat and a cough. The following morning when I went to an area fitness center to do my regular weightlifting routine, I noticed my eyes were still stinging and I had much more difficulty exercising because of continued

breathing difficulty.

In addition to these obvious health problems, there is a non-health issue which occurs repeatedly among everyone I have spoken to when they visit the above places of business. The following morning my wife and I arose and noted the characteristic stale, foul stench of tobacco smoke on our pillows, in our hair and on our clothes, many of which had to be dry cleaned to make them wearable again. It is easy to see, then, that passive smoke significantly affects not only people's health, but also their wallets.

Only a month prior to these hearings we visited the same bar mentioned above and several similar places, and the experience we had was virtually identical except that now we are much more acutely aware of the specific problems caused by ETS, based on the EPA report. I would like to mention one last anecdote which occurred recently in a new restaurant in Knoxville called Merlot's, where the food would be outstanding were it not for the poisoned air. In this rather formal restaurant there is no designated smoking area whatsoever. We and our friends had the misfortune of being seated at a table next to two groups of people who chain-smoked throughout dinner. One individual seemed to enjoy his cigarettes more than the food, to the point that he smoked most of the time but occasionally did take an eating break.

After dinner on our way out of the restaurant, I complained to the manager -- who happened to smoke -- and he showed very little concern but did comment that he would leave things as they were until the state or federal government legislated differently. It is also interesting that as we discussed this near the entrance of the restaurant, the young woman who was the seating hostess puffed away on a cigarette as she worked. The point of

all this is that frequently owners or managers of businesses who also smoke demonstrate little concern for the health of people exposed to passive smoking.

I can relate similar experiences at other public places, such as airports. Before the Knoxville Airport became 100% smoke-free (details noted below), it was difficult to differentiate a smoking from a smoke-free indoor area. When the ban did occur in mid-1993 my family and I flew to Atlanta where, at the time, people could smoke anywhere. Upon stepping out into the concourse there, the difference was immediately noticeable by the stale odor and a fine haze that hung in the air as far as the eye could see down the terminal. As anyone who has visited the Atlanta Airport knows, it is a large, open, cavernous-type building; yet even there, the ETS is a noticeable and significant problem.

Another large public place which is a quite open area is the shopping mall. When West Town Mall in Knoxville decided to allow smoking only in designated areas in November, 1993, one would have thought this to be a reasonable solution. Unfortunately, it did nothing to diminish the overall amount of smoke in the air and in fact, a large number of people seemed to simply ignore the policy and smoke where they pleased. Even in the seating areas where signs say "no smoking" and the ashtrays have been removed, one can still find people smoking as well as numerous cigarette butts snuffed out on the flat, bare metal tops of the trash containers.

Everyone should clearly understand that the above examples cannot be viewed in isolation, but have to be considered in terms of the fact that they occur repeatedly in every type of public place, and such adverse experiences

affect numerous people day after day and week after week. In other words, the public ETS problem and its effect on nonsmokers, both adults and children, is a chronic one. It is this chronic exposure which ultimately leads to the serious illnesses which have been reported and summarized in the EPA report.

Since I began working on this issue over a year ago, my friends have recounted to me over and over again experiences similar to those noted above. The patients I see in my office have done the same as well and voiced their concern for family members being treated who have underlying heart or lung disease. More significantly, they voice concern for their children and/or grandchildren. Because of all of these problems, you may well imagine my significant, ongoing concern and fear regarding the adverse health effects of ETS on my family, friends and patients, particularly given the knowledge I possess as a cancer specialist and my awareness of the EPA study and related reports. It seems that the majority of the public has one of two choices: either go out to enjoy a nice meal, a few drinks and/or various forms of entertainment at the expense of repeatedly risking their health; or don't go out nearly as much or at all in order to protect their health. This particular set of circumstances seems absolutely unacceptable and clearly makes a case supporting the passage of the Smoke-Free Environment Act.

As I mentioned above, in Knoxville our airport made the decision to become 100% smoke free and this went into effect in July, 1993. This decision was reported and applauded in our paper (Item #14). The airport itself received a few complaints; however, the public was overwhelmingly supportive of the decision by a margin of about 12 to 1, according to the Airport Authority. Around the same time, in June of 1993, the newspaper reported our

mayor's decision to consider a smoke-free ordinance for city restaurants (Item #15). In addition, the Mayor and the County Commission made the decision to make all Knox County-owned buildings smoke free and stressed the importance of this policy to city employees, noting that it would be "another good reason to quit smoking." Of interest is the fact that it was Mr. Joe May (Mayor's Assistant), an active member of our Coalition, who sponsored the County Commission bill. (It happens that in the past he smoked.) He also proposed that a similar ordinance be developed for area grocery stores. Within the next few months it was clear that such a move was not necessary, since virtually all of the area groceries, the most numerous being Kroger stores, voluntarily adopted a smoke-free policy.

Although the restaurant ordinance did not ever get formulated (primarily due to low City Council support), most restaurants again affirmed their belief that they "wish the government would take care of it for them and take them off the hook."

An unexpected and indirect reaction to the proposals of Mayor Ashe occurred a few weeks later and was published on 6/16/93 in the newspaper. The Arts Council, a local group which has long promoted and sponsored numerous cultural events for the city, was threatened with the loss of a grant from Philip Morris (Item #16). Mr. Ron McMahan, who is a public relations consultant, wrote a letter (Item #17) to Mrs. Joan Ashe, the wife of the mayor and also the Chairperson of the Arts Council. Mr. McMahan, who happens to smoke and formerly worked for Senator Howard Baker, has as one of his clients Philip Morris. His contempt for the efforts of the mayor and our Coalition can be summed up in one of the comments he made: "I must tell you

that I can no longer ask my client to fund these worthwhile endeavors. Philip Morris's patronage would be paradoxical, given the City of Knoxville's continuous irresponsible and dictatorial attacks on this industry."

The very morning that the press reported these events, I personally called Mrs. Ashe and informed her that if the \$5,000 grant was withdrawn I, along with my Coalition partners and others, would make up for it; and if this were not possible, I would that very day write her a personal check for that amount. I told her that it was unconscionable what Mr. McMahan was doing, and that it would probably be best if the Arts Council refuse the grant even if it were offered later, since there appeared to be significant strings attached. A Knoxville attorney also offered \$5,000, and these events are well reported in Items #18 and 19.

Over the subsequent four weeks we were successful in raising a total of about \$13,500 among area physicians, and when added to Mr. Lee's \$5,000 the amount exceeded the previous Philip Morris grant several times over.

In the midst of all of these activities and events which have occurred in Tennessee and around the country, the Tobacco Cartel has continued to attempt to cast doubt on the validity of the EPA report. This is typical for them and comes as no surprise, but must be recognized for what it is: propaganda. I would in fact submit that the primary motivating factor behind all of their efforts is the desire to protect billions of dollars in profits. Once again, these are the same people who for thirty to forty years have denied any significant link between direct smoking and various diseases such as lung cancer.

In July of 1993, several reports appeared in the medical literature

which speak to the issues of ETS in public places and the matter of tobacco industry campaigns of deception and misinformation. A review by Dr. Glantz from the University of California at San Francisco, entitled "A New Tobacco Industry Strategy to Prevent Local Tobacco Control," looked at the attempts to counter local smoke-free ordinances in California (JAMA, 1993; 270: 479-486) (Item #20). Millions of dollars have been spent in professionally organized campaigns. They tout so-called "smoker's rights" with R.J. Reynolds's Choice and Philip Morris's Smoker's Advocate publications. They organize and fund front organizations to carry out the campaigns and conceal the fact that they are behind such groups. One reason for this approach is that the tobacco industry itself realizes it has for years had very little public credibility. One front group, the California Business and Restaurant Alliance, presented a misleading study saying that in certain locations where a smoke-free ordinance was passed, restaurants experienced a decline of more than 30% in daily customer volume. In fact, these results were later found to be incorrect when an independent analysis of sales tax receipts was conducted. Californians for Fair Business Policy was another front group which received 99.5% of its funding from tobacco companies. In petition drives to overcome tobacco control, they hired circulators who were paid by the signature. It was found that some such circulators did not even live in the same jurisdiction, and this is a legal violation. They also misinformed people about the nature of the petition. The extent of money spent by the industry is suggested by a spokesperson for Philip Morris, who commented, "When it comes to protecting the rights of smokers there is virtually no limit on the amount of money we will spend." In Sacramento, the

Californians for Fair Business Practices attempted to defeat an ordinance by sending out mailers suggesting there would be "cigarette patrols." Some phony emergency telephone numbers were enclosed, one of which was for the fictitious cigarette patrol. Voters were urged to keep the numbers by their telephones. The brochure also contained a memo from the Sheriff's Department about budget cuts. This gave the false perception that the ordinance would affect the department, when in fact there was no relation; and also implied that the sheriff opposed the smoke-free ordinance. When misinformation campaigns such as this were exposed, the ordinance succeeded in passing.

The fact that secondary smoke affects the health of nonsmokers in places such as restaurants is a key issue supporting the passage of the Smoke-Free Act. An additional concern has been raised which would favor the act but has not been discussed much until recently. I refer to the effects of ETS on employees of restaurants or bars, who spend much more time there, on a regular, long-term basis, than the patrons.

Dr. Michael Siegel, now with the Centers for Disease Control and Prevention, published the review "Involuntary Smoking in the Restaurant Workplace" (JAMA 1993; 270:490-493) (Item #21). In this paper he reviewed several reputable studies and found that "Taken together, these studies suggest that there is an excess lung cancer risk of approximately 50% (range 10-90%) among food service workers, compared with the general population, controlling for active smoking." This elevated risk for lung cancer occurred among employees of bars as well as restaurants.

These results lend further support to the finding of the EPA that ETS is

a Class A carcinogen which can lead to lung cancer in nonsmoking individuals. Dr. Siegel concludes in his paper, "Public health efforts to regulate smoking in bars and restaurants can no longer focus only on protecting the patron. Food service workers must be afforded the same public health protection as other workers. To protect these workers from the hazards of ETS, smoking should be prohibited in bars and restaurants."

Soon after publication of the above paper, the typical tobacco company campaign of misinformation began its attempt to discredit Dr. Siegel's findings. He responded to these criticisms in writing and countered each one, point for point (Item #22). One example serves to illustrate quite well the misleading statements from the Tobacco Institute in contrast with the response from an experienced, independent researcher. The Tobacco Institute: "In one case Dr. Siegel cites a study as supporting his case, when in fact the study reported that worker exposure to ETS is up to three orders of magnitude lower than the level that U.S. OSHA considers permissible for an 8-hour workday." Dr. Siegel: "There is no OSHA standard for ETS exposure, so this argument is meaningless."

Following the report of ETS and lung cancer risk among restaurant and bar employees, a second set of letters was sent to about 45 restaurants in September, 1993 (Item #23). In this letter I pointed out the findings of Dr. Siegel's review as another strong reason for adopting a 100% smoke-free policy. A single restaurant, Tuscany, responded to this as discussed below.

As our Coalition efforts continued in Knoxville and across the state, it was suggested in July 1993 that I appear on a local TV talk program. This program, "The Tennessee Report," appears on the local ABC affiliate, and one

of the main panelists happens to be Mr. Ron McMahan, a smoker with strong ties to Philip Morris, as previously mentioned. When I approached the moderator, Mr. Rick Benjamin, about this idea he seemed enthusiastic and said he would get back with me on it. A week later, having heard nothing, I called and he was strangely cool to the idea. He claimed that the smoke-free campaign in Knoxville was "not a political issue," even though I pointed out its obvious political elements. It was not until I wrote a letter to the editor of our newspaper that the station took notice and agreed to have me on the program in September.

Various panelists debated the issue with me, using two major strategies which illustrate the typical form of deception and misinformation that has long been practiced by the tobacco industry. First, they attempted to divert the discussion onto the subject of alcohol and tried to draw comparisons between alcohol and secondhand smoke. Secondly, Mr. McMahan repeatedly pointed out that an ordinance would be too much "government intervention," and that if owners wanted their establishments smoke-free they should voluntarily prohibit smoking. This counters the reality stated earlier, a finding consistent throughout the United States: that most restaurant owners would prefer a government mandate so that they can avoid the problem by having it applied uniformly. Lastly, the issue of "discrimination" was raised in a preposterous attempt to suggest that smoking cigarettes, or nicotine addiction, identifies a special class of individual requiring some form of protection. These points are important to understand in that when they are raised before an unsuspecting audience the effect is extraordinarily misleading.

Soon after this TV debate I had occasion to travel to Memphis for a medical school reunion in October, 1993. Many of the activities were held at The Peabody, a renowned and luxurious five-star hotel. One of my colleagues in Memphis working on the same issues, Mr. Russ Petty, works closely with the owners of this hotel and was given assurances that there would be a smoke-free policy put into effect. Unfortunately, this never came about.

The lobby of the hotel is an extraordinarily popular gathering place and thus is usually very crowded. A major reason for this attraction is the famed ducks who swim in the lobby fountain. In order for my friends and I to converse, enjoy wine, listen to music and watch the ducks, we had to also endure breathing the thick tobacco smoke hanging in the air. Along with concern for the large numbers of people being repeatedly exposed to ETS, one must even wonder if the ducks are safe.

I wrote a letter to the hotel owners and their inadequate response is enclosed (Item #24). The absence of concern they demonstrate and the fact that no significant measures have been taken to protect the public from ETS is another of the many strong factors supporting the passage of the federal Smoke-Free Act.

In November of 1993, further efforts were made on behalf of the Coalition to promote smoke-free public places during the week of the Great American Smokeout. These efforts are well summarized in the news report from November 15, 1993 (Item #25). One very fine Italian restaurant in our city, Tuscany, made the decision to become smoke-free for the week. It was so successful that they have maintained the policy, although there is a somewhat separate bar area where people can light up. The owner, Mrs. Faye Benedetti,

commented in March of 1994 that the policy had been generally well received and although an occasional customer was lost, business is as good as ever. In fact, she believes many new customers have been gained.

By the end of 1993, much progress had been made in this area and across the state because of the efforts of the Coalition and other concerned groups. Regrettably, much remains to be done and some of the progress made during 1993 may be lost. Given the fact that the Medicaid system in this state has been replaced by Governor McWherter's ambitious TennCare plan, one would expect our legislature to be interested in all matters of health care reform. Unfortunately, this does not appear to be the case -- in spite of the fact that a vast proportion of the former Medicare/Medicaid system's debt was the result of the diseases caused by chronic tobacco poisoning among low income residents. These individuals have far higher rates of smoking and its related diseases than other groups. In early 1993, the legislature failed to consider a modest increase in the state cigarette tax even though it would have helped fund the floundering Medicaid system. Even now in March, 1994, certain legislators are presenting bills such as H.B. 1913 and 2483, which if passed would mandate a 25% smoking area in any public place licensed to serve alcohol. With the support of the tobacco lobby, it is clear that the ultimate intent of these bills is the same as any other such legislation presented around the country: the industry and their supporters want to be certain every public place has a smoking area. Such bills demonstrate a total disregard for the public's health in the context of ETS. The absurdity of these pro-tobacco lawmakers can be well understood by other bills they have presented, especially those from Representative Tommy Haun (Greeneville),

namely H.B. 2482, which would require that when multiple alcoholic drinks are served at a discount there must also be discounts on tobacco products. His other bill, H.B. 2484, would repeal all existing taxes on tobacco products in Tennessee.

When the 25% smoking area bill was passed through a house subcommittee, some legislators responded as follows: "Well, alcohol is a problem too, so why not treat both equally?" and "Well, I understand the ETS issue and know most of my constituents are not for this bill, but I had to vote for it anyway to help out my buddy in the House." The most unbelievable comment came from House Member Haun, who was quoted in the Memphis Business Journal 2/14/94 as suggesting that there may be an advantage to promoting smoking in bars, since "Some of those potential drunk drivers we're going to knock off with secondhand smoke" (Item #26). The influence of the tobacco industry and their lobbyists on our legislature and the irresponsible activity on the part of certain lawmakers make another strong point supporting the immediate passage of the Federal Smoke-Free Act.

Early in this written testimony it was stated that the Tobacco Cartel is making every effort to discredit the EPA report on the adverse health effects of passive smoke exposure. They have focused primarily on disputing the evidence about lung cancer. Over the past ten years, authoritative independent researchers around the world have published evidence which supports all of the findings in the EPA review. The fact that the tobacco industry is incorrect in its assertions is supported by the continued publication of papers appearing in the literature after the EPA report was released, and which further document the diseases caused by secondary smoke.

One of these, Dr. Siegel's paper on lung cancer risk among employees of restaurants and bars, has already been discussed. When the industry is questioned on its doubts about ETS and disease, they primarily focus on lung cancer; they have said little to try to dispute the much larger number of non-malignant problems including bronchitis, pneumonia, new cases of asthma, worsening cases of established asthma, upper respiratory infections, allergic symptoms and ear problems in adults and especially children, including infants under the age of 18 months.

A paper published in 1993 by Dr. Haddow and others further strengthens the case against ETS by demonstrating tobacco smoke metabolites in the urine of asthmatic children, which correlates with worsening of their pulmonary function (N.Engl.J.Med. 1993; 328:1665-9) (Item #27). They reached the same conclusion as the EPA and the Surgeon General's office, that there must be "systematic, persistent efforts to stop the exposure in children with asthma to ETS." A paper by investigators from the Hospital for Sick Children in Toronto documents the presence of smoke constituents in the hair of the newborn infants of mothers who never smoked, but were repeatedly exposed to ETS during pregnancy. They conclude that this "reflects long-term, systemic exposure to these toxins and therefore may be well correlated with perinatal risks" (JAMA 1994; 271:621-623) (Item #28).

Given the seriousness of the non-malignant diseases caused by ETS and the fact that literally millions of people are affected, I believe it is reasonable to say that even if there were not conclusive evidence on lung cancer, the enormity of the other problems by themselves would justify passage of the Smoke-Free Act.

As previously documented, the tobacco industry has consistently engaged in well-organized and well-funded campaigns of deception and misinformation. They have even paid for symposia on ETS, and the proceedings of these meetings have then often been published in non-peer-reviewed journals. The industry then turns around and cites these very same proceedings in order to try to support their position that ETS is not harmful. Dr. Bero and others found that articles developed out of the industry's own sponsored symposia, as compared to independent journal publications, were more often reviews rather than original work, less frequently carried statistical methods sections, agreed with the tobacco industry position more than twice as often and were much less likely to assess the health effects of ETS. They disclosed the source of their funding significantly less often and were written by tobacco industry-affiliated authors 35% of the time, as compared to only 6% of journal articles. In simple terms this means, as the authors comment, that "Tobacco industry-sponsored 'symposia' consist in large part of reviews of articles that reach conclusions that are contrary to independent scientific consensus documents and meta-analyses published in journals." Furthermore, it can be concluded that "The tobacco industry cites these symposia as being the consensus of leading scientific experts gathered from around the world who disagree with the published reports on ETS."

All subcommittee members as well as other concerned individuals should be aware of this sophisticated campaign of misinformation. The above AMA journal article points out that the industry has known passive smoking to be a threat to its product since 1978, when it started developing a strategy to refute the association between ETS and ill health. Mention is made of a study

by the Roper Organization for the Tobacco Institute, which concluded that "ETS is the most dangerous development to the viability of the tobacco industry that has yet occurred. The strategic and long-run antidote to the passive smoking issue is, as we see it, developing and widely publicizing the clear-cut, credible medical evidence that passive smoking is not harmful to the nonsmoker's health." Policymakers should be aware of the type and quality of the scientific literature on which they base policy regarding ETS exposure. The paper referenced above is entitled "Sponsored Symposia on Environmental Tobacco Smoke" (JAMA, 1994; 271:612-617) (Item 29).

Finally, with respect to Tobacco Cartel propaganda, I would touch again on the misleading reports they generated suggesting a 30% drop in business among smoke-free restaurants in parts of California. A 1993 presentation to the American Public Health Association by Dr. Glantz from the University of California in San Francisco sets the record straight on this issue: "There is no evidence that 100% smoke-free restaurant ordinances have any effect on restaurant sales. Public health officials can enact such health and safety requirements to protect patrons and employees in restaurants from the toxins in secondhand tobacco smoke without the fear of adverse economic consequences" (Item #30).

In concluding my testimony it should be understood that "In the 30 years since the first Surgeon General's Report on Smoking and Disease, our government has done next to nothing to achieve effective tobacco control. Congress has failed to pass most of the more than 1,000 tobacco control bills which have been introduced in the last 30 years," as pointed out by the National Office of the Coalition on Smoking OR Health in a tobacco control

review in the Journal of the AMA (JAMA, 1994; 271:645-647) (Item #31). During this same time, the Tobacco Cartel has continued to try to cast doubt on the health problems caused by smoking. We, course, know better; because the reality is that about 460,000 people will die this year as a result of tobacco-caused diseases by way of firsthand use and secondhand smoke. Moreover, the Centers for Disease Control and Prevention has concluded that as an actual cause of death, in the United States tobacco rates number one. The total cost in lives exceeds by over ten times the number of people who will die from AIDS this year, and is more than four times greater than the annual losses attributable to alcohol. Lung cancer is now the leading cause of death from cancer among both women and men. Since 1988 the death rate has exceeded that for breast cancer and continues to rise. The Mayo Clinic Foundation reported that "In the United States alone, almost 175,000 new cases of lung cancer will occur in 1993 and will cause more than 140,000 deaths. This outcome is equivalent to one fully loaded 747 jumbo jet crashing every day throughout the year, and approximately two million premature deaths by the end of the century" (Mayo.Clin.Proc. 1993; 68:168-169) (Item #32). This same paper notes that over 60 years ago, Mayo Clinic researchers began to suspect an epidemic of lung cancer, since over a period of years they had accumulated twelve known cases of this disease. At the time, most people found this unbelievable, since lung cancer was such a rare tumor! Now, many decades later, there are approximately twelve patients with lung cancer seen at the Mayo Clinic alone each week!

It is unbelievable, unconscionable, unacceptable and shameful that so little progress has been made and that the epidemic of diseases caused by

chronic tobacco poisoning has continued to worsen. It has now been about 10 years since the first reports on the dangers of secondhand smoke began to appear in the scientific literature. We must not fail to take meaningful action on this profound public health problem. We must always remember that those in the tobacco industry remain the absolute masters of deception and misinformation. They are followers of the dictum, "If you repeat a lie enough times, the people will believe it to be the truth."

I would urge each member of this subcommittee to realize the simple and fundamental fact that smoke-free legislation is purely a matter of public health. Do not be deceived by the phony arguments of the Tobacco Cartel; this issue has nothing whatsoever -- I repeat, NOTHING -- to do with so-called "smoker's rights," the Constitution, the Bill of Rights or personal freedom. The very term "smoker" is a label which has been misused in a way that is largely a concoction of the industry. Nicotine addiction is not recognized as a fundamental, personal characteristic in the way that race, gender, nationality, religious affiliation or disability is. Therefore, there is no fundamental "right to smoke" and cigarette use cannot and must not be used as a means to identify a special class of individuals needing some sort of protection.

It ought to be clear that no one is "banning" smoking; that is another term that has been misrepresented by the tobacco lobby in order to formulate a smokescreen to cloud the judgement and decision making of legislators, and the opinion of the public. Smoke-free policies and legislation simply ask that if you smoke, please don't make others around you smoke and endanger their health; but rather step outside, or at least into an area where no one else will be affected.

I ask each of you to seriously and honestly consider all the facts presented in my testimony, and to act responsibly and in the best interest of the American public. Decisive, progressive and meaningful action on tobacco control measures such as the Smoke-Free Act will ensure that all of us, especially our children, will enjoy a tobacco-free and healthier 21st century.

Mr. WAXMAN. Thank you very much, Mr. Carter.
Mr. Tooker.

STATEMENT OF RICHARD M. TOOKER

Mr. TOOKER. Good morning. I am Rick Tooker. I am the chief medical officer and the chief medical examiner for Kalamazoo County, Mich. I am a Board-Certified family physician, an emergency room physician and a medical epidemiologist. I am here today to represent the 226,000 citizens of Kalamazoo County. I am speaking as a member of the National Association of County Health Officers. I am here also on the behalf of the American Heart Association. In my role as public health physician and medical epidemiologist, I have a duty to promote the health and prevent disease for all who live and work in Kalamazoo County. A significant amount of my time is spent patiently working with smokers and non-smokers alike to reduce tobacco-related indoor air pollution. This is a good use of my time, as tobacco-related death and disease is the most preventable health problem in the United States. I have worked with restaurants, schools, private businesses, government units, colleges and universities on reducing indoor tobacco pollution. I am convinced that a uniform national guideline is essential. Representative Waxman's smoke-free environmental policy is indeed good public sense.

In my professional experience, representatives of public places do not view a uniform smoke-free policy as overly intrusive or restrictive, even good, solid Republicans. Indeed, almost everyone I have worked with in the past 10 years are demanding an even playing field, as we have heard here today already. The concern of overly confusing, differing policy by area or type of agency, is actually producing a lot of anger and frustration. People responsible for public places and people using public places, in my experience, want simple, clear, and concise policy.

Representative Waxman's proposed policy is virtually identical, in fact, to policy I have helped institute in public, private, educational and government facilities in Kalamazoo. Concerns and complaints of over-regulation have been very very minimal. In fact, a collective sense of relief is the norm in my experience. People want a policy that applies the same in Kansas City as it does in Kalamazoo. This will not happen without national policy, however.

Those responsible for the health and well-being of patrons are happy for a simple statement of indoor air pollution reduction that enhances the health and safety of people. Smokers, when properly represented in decision making, are happy for a clear-cut direction on how not to harm other people until they quit smoking. Our own Kalamazoo County buildings have a smoke-free ordinance that has been successful for over 3 years, and it certainly is not radical, as Representative Bliley has suggested. It had reduced indoor air pollution and has prevented exposure of workers and visitors to tobacco chemicals. These chemicals we cannot, by law, put into our county solid waste landfills. In fact, these chemicals are dangerous enough that we cannot have them emitted from smoke stack—from factory smoke stacks in our community. I have a duty to enhance the safest environment in my county. To do this, I cannot treat indoor tobacco air pollution differently than any other exposures in

my county. Until this issue improves, I cannot provide enough direct attention to other significant environmental threats, such as childhood lead poisoning.

As an emergency room physician and chief medical examiner, I have been alarmed with the well-documented increase in asthma and severe respiratory disease in my county. In my personal and professional experience, this unprecedented rise, including fatal asthma attacks, is overwhelmingly related to indoor tobacco pollution. Although, we cannot regulate individual homes, and we never should, we can do so in public places.

Finally, an example of my concern as illustrated by a medial examiner case that I investigated in the city of Kalamazoo. A 20 year-old college student with a history of asthma died in his car outside of the restaurant/nightclub establishment that he was patronizing. He was in the process of trying to get to his asthma medication when he died. Although he had been known to have some sensitivity to tobacco smoke in the past, that evening's severe, fatal reaction to a smoke-filled room could in no way be predicted.

In conjunction with the forensic pathologist consultation and an autopsy, the cause of death was listed as acute asthmatic attack, due to, or a consequence of exposure to tobacco smoke. This was but one of thousands of similar cases that happen every year.

In conclusion, public health and preventive medicine will be greatly enhanced by the success of H.R. 3434, and what a great place to start health care reform.

Thank you.

Mr. WAXMAN. Thank you very much, Mr. Tooker.

Mr. Hall.

STATEMENT OF JOHN R. HALL, JR.

Mr. HALL. Thank you, Mr. Chairman. I am John R. Hall, Jr., the assistant vice president for fire analysis and research of the 60,000-plus member National Fire Protection Association. At NFPA, we define our mission to be the safeguarding of people, their property, and the environment from destructive fire and related hazards such as electric shock. We recognize, as you do, that fire is a relatively small part of the hazards targeted by the Smoke-Free Environment Act of 1993, but smoking is a significant portion of the fire problem in public facilities. Thus, we at NFPA and the many people we represent who are concerned about fire safety, have a vital interest in the success of this bill.

Lighted tobacco products started an average of 14,300 fires a year during 1987 to 1991 in public facilities alone. These led to an average of 46 civilian deaths a year, 421 civilian injuries a year and \$118 million in direct property damage. If you add in the accidental fires started by matches or lighters, whose principal role is to light cigarettes and other tobacco products, the average death toll rises to 55 to 60 lives lost per year, making smoking implements defined generally the second leading cause of fatal fire in public facilities, behind arson and suspected arson.

The public facility properties that account for the largest number of smoking-related fire deaths are hotels and motels, and facilities that care for the aged, such as nursing homes. In recent years, both

of these industries have taken steps in the direction proposed by this legislation, and my testimony describes these briefly. Individual incidents from these two types of properties also illustrate both the need for this legislation and the difficulties we will all face in making it effective.

We have records on at least one health care facility incident in which a patient actually attempted to smoke while receiving oxygen, creating a fire that killed the patient and four other people. We also have records on one hotel fire in a fully sprinklered facility in which a guest dropped a burning match, igniting his clothing as he lay directly under a sprinkler. He suffered fatal injuries before the sprinkler could respond.

The message from these incidents has several parts. Smoking is an addiction. In service to that addiction, people may be driven to ignore the most basic and obvious rules of safety. Moreover, smoking is capable of causing a fire so close to a person that severe damage can result before any fire protection systems or provisions, no matter how effective or reliable can hope to respond. In other words, the need for restrictions on smoking cannot be eliminated by any other fire safety program. You cannot make detectors and sprinklers that are fast enough, and you cannot fire-proof everything from mattresses to upholstered furniture, to trash. Restrictions on smoking will reduce fire losses that no other program can reach.

It should not be inferred, however, that smoking-related fires are uniquely the problem of smokers. We recognize, as you do, that the public is far more afraid of the threat of deadly fire started by a stranger in a public place, even though that risk is much smaller than the risk of deadly fire in people's homes and personal vehicles. NFPA's own codes and standards and all other fire safety requirements reflect those values, as they pay greatest attention to and set the strictest standards on the fire hazards of public places.

With that thought in mind, it should be noted that—

Smoking-related fires in public facilities had effects beyond the smokers who caused those fires. Sixteen percent led to flame damage outside the room of fire origin. Forty-one percent led to smoke damage outside of the room of fire origin. Forty-seven percent of the people killed by these fires were not intimate with ignition, a term we use for very close to the point of fire origin. Twenty-one percent of those killed were not even in the same room where the fire began.

Meanwhile, 74 percent of the people injured by these fires were not intimate with ignition and more than half, 54 percent, were not even in the same room where the fire began.

Mr. Chairman, thank you for this opportunity to present you with some basic facts on fire losses due to smoking in public facilities and to convey the strong support of the National Fire Protection Association for the Smoke-Free Environment Act of 1993.

[The prepared statement of Mr. Hall follows:]

STATEMENT OF JOHN R. HALL, JR.

Mr. Chairman, I am Dr. John R. Hall, Jr. and I am the assistant vice president for fire analysis and research of the 60,000+ member National Fire Protection Association (NFPA). At NFPA, we define our mission to be the safeguarding of people, their property, and the environment from destructive fire and related hazards such

as electric shock. We recognize, as you do, that fire is a relatively small part of the hazards targeted by the Smoke Free Environment Act of 1993, but I hope to show you today that smoking is a significant portion of the fire problem in public facilities. Thus, we at NFPA and the many people we represent who are concerned about fire safety have a vital interest in the success of this bill.

Chairman Henry Waxman and the cosponsors of this important legislation are to be congratulated for their courage in tackling the major problem of smoking in public facilities with the directness it requires.

Lighted tobacco products started an average of 14,300 fires per year during 1987 to 1991, the latest years for which we have data, in the non-residential structures (plus hotels and motels) that we understand to be the focus of this legislation. These fires led to an average of

- 46 civilian deaths per year,
- 421 civilian injuries per year, and
- \$118 million per year in direct property damage.

If you add in the accidental fires started by matches or lighters, whose principal role is to light cigarettes and other tobacco products, the average death toll rises to 55-60 lives lost per year, making smoking implements defined generally the second leading cause of fatal fire in public facilities behind arson and suspected arson.

The public facility properties that account for the largest number of smoking-related fire deaths are hotels and motels and facilities that care for the aged, such as nursing homes. In recent years, both of these industries have taken steps in the direction proposed by this legislation.

Many major hotel chains now offer whole floors of rooms in which smoking is prohibited. This would be expected to have a very modest impact, if any, on the smoking-related fire problem, but it does show a growing industry sensitivity to the public's awareness of the risks of secondhand injury or illness associated with smoking.

In accord with new criteria for Medicare-reimbursement eligibility, most facilities that care for older people and the rest of the health care industry have very recently begun restricting smoking in a manner very similar to what is proposed by this legislation. Some facilities have chosen a total ban, others a restricted area for smokers. Still others have chosen to allow smoking by patients under the direct supervision and scrutiny of a nurse or doctor, an option that makes sense for health care facilities but in few other places.

Individual incidents from these two types of properties illustrate both the need for this legislation and the difficulties we will all face in making it effective. We have records on at least one health care facility incident in which a patient actually attempted to smoke while receiving oxygen, creating a fire that killed the patient and four other people. We also have records on one hotel fire in a fully sprinklered facility in which a guest dropped a burning match, igniting his clothing as he lay directly under a sprinkler. He suffered fatal injuries before the sprinkler could respond.

The message from these incidents has several parts. Smoking is an addiction, and in service to that addiction, people may be driven to ignore the most basic and obvious rules of safety. Moreover, smoking is capable of causing a fire so close to a person that severe damage can result before any fire protection systems or provisions, no matter how effective or reliable, can hope to respond.

In other words, the need for restrictions on smoking cannot be eliminated by any other fire safety program. You cannot make detectors and sprinklers that are fast enough and you cannot fireproof everything from mattresses to upholstered furniture to trash. Restrictions on smoking will reduce fire losses that no other program can reach.

It should not be inferred, however, that smoking-related fires are uniquely the problem of smokers. We recognize, as you do, that the public is far more afraid of the threat of deadly fire started by a stranger in a public place, even though that risk is much smaller than the risk of deadly fire in people's homes and personal vehicles. NFPA's codes and standards and other fire safety requirements reflect those values, as they pay greatest attention to and set the strictest standards on the fire hazards of public places.

With that thought in mind, it should be noted that many of the 1987 to 1991 smoking-related fires in public facilities had effects beyond the smokers who caused those fires:

- 16 percent led to flame damage outside the room of fire origin;
- 41 percent led to smoke damage outside the room of fire origin;
- 47 percent of the people killed by these fires were not "Intimate with ignition", that is, very close to the point of fire origin, and 21 percent of those killed were not even in the same room where the fire began; and

—74 percent of the people injured by these fires were not intimate with ignition, and 54 percent were not even in the same room where the fire began.

I would like to make one more point before I close. As a spokesman for the NFPA, I can only provide expert testimony specifically on the size and nature of the fire losses that this legislation will affect. However, as an employee of NFPA, working in an office building owned by NFPA, I can say something about our organization's approach to the larger issues addressed by this bill.

Several years ago, NFPA made its building smoke-free, allowing only a single room, environmentally isolated from the rest of the building, to be used for smoking. In addition, as an employer, NFPA has added benefits available only to employees who do not smoke, including an extra day of paid vacation per year. We at NFPA know that cigarettes and other lighted tobacco products lead to 1,000 office building fires a year, but that is not the only reason for our actions. We simply realized that in this day and age, any organization that claims to be about health and safety must take a firm stand on smoking within the public spaces it controls.

This step has not been easy and has not been without controversy. We are not the only tenants in our building, and we have to set rules for our building that allow us to operate in a very competitive real estate market. But we've been able to do this and still take this important step for the health and safety of our occupants.

Thank you for this opportunity to present you with the facts on fire losses due to smoking in public facilities and to convey the strong support of the National Fire Protection Association for the Smoke Free Environment Act of 1993. I will be happy to answer any questions you may have.

Mr. WAXMAN. Thank you very much, Dr. Hall. I want to welcome two of my constituents, Mr. Cole and Mr. Naylor, who have come here from Los Angeles, Beverly Hills. We welcome you hear and want to hear your testimony.

STATEMENT OF RUDY COLE

Mr. COLE. Thank you, Mr. Chairman. You will also be happy to know that this is not a unanimous panel on this issue. My name is Rudy Cole. I was the former executive director of the Beverly Hills Restaurant Association during our city's rather famous and rather infamous experiment with a total ban on smoking.

I am a member of the Recreation and Parks Commission in my city and I have served three terms as president of the Beverly Hills Democratic Club. Unlike the Republican from Ohio who supported you on this issue, Mr. Waxman, I voted for you in spite of your position on this issue.

I must admit that when Beverly Hills adopted the ban on smoking, I thought the restaurants opposing it were making a serious mistake. After all, Beverly Hills is an island surrounded by Los Angeles. I thought all the non-smokers in Los Angeles would rush to Beverly Hills and a smoke-free island, and that simply didn't happen.

The weeks immediately following the passage of the ordinance were the worst weeks in the history of the industry. Even non-smokers joined our campaign for repeal. They were all too well aware of the reduction of services caused by business losses.

What we have now is working. It is acceptable to both smokers and non-smokers and is enthusiastically supported by the restaurant employees. We have a 40 percent smoking section. Some have tried to dispute what is obvious in our city. They have tried to claim there was no business losses. But the proof is in the action of our City Council. They were not responding to some campaign by the tobacco companies of their interest.

Mr. Waxman, you know the members of our City Council. You know they would only have repealed the ordinance if they felt it

was wrong, harmful to our restaurants, and not in the interest of our city. The Beverly Hills experiment, the first ever aside from Aspen, taught us some truths about total bans. Tourists chose other venues. Smokers sought out places where they could smoke, including other cities, but they also found private clubs.

Of most importance, smokers simply did not eat out as often. Restaurants depend on larger parties for profit, the tables of four or more. If one person in a party wants to smoke, that person will often determine where they dine out or find a place where smoking is permitted.

Even if there is a national ban and smokers have no choice, except places that refuse to comply, restaurants will be hurt because for smokers, dining and smoking is a related entertainment experience. They simply will not eat out as often.

Yes, there are restaurants that have voluntarily prohibited smoking, but almost universally these are fast food establishments. The name is the answer. They are not anxious to have patrons stay after a meal with a cup of coffee or a drink or dessert. They want their patrons to eat and move on, and that is why they are called fast food.

On the other hand, a national prohibition will hurt the dinner houses, the coffee shops near factories, the ethnic restaurants, and those heavily dependent on tourism. Prohibition began in small towns in Ohio and it led to a failed and tragic experiment that created more problems than it solved. It has been said that prohibition drove people to drink. Do we want smokers scoffing at laws, employment of law enforcement agencies enforcing laws when there are far more serious problems of crime in our country?

When restaurants find their customers want an end to smoking, they will establish immediate rules banning smoking. They are, after all, an accommodation industry and not anxious to go out of business for some ideals of personal freedom.

Yes, the movement to ban smoking in public places began in Beverly Hills. Fortunately, our city had the wisdom to step back from the near hysteria surrounding this issue and reversed itself. We do not encourage or defend smoking any more than those who favor prohibition, but, in the end, prohibition would encourage drinking.

We do favor responsible, reasonable compromises that will serve all the patrons of the best restaurants in the world.

Thank you.

[The prepared statement of Mr. Cole follows:]

STATEMENT OF RUDY COLE, RESTAURANTS FOR SENSIBLE VOLUNTARY POLICIES

Mr. Chairman, distinguished members of the subcommittee, I am happy to be with you today to discuss H.R. 3434, introduced by Rep. Henry Waxman. I am Rudy Cole, executive director of Restaurants for a Sensible Voluntary Policy (RSVP). We are a group of restaurateurs in California who have united primarily to oppose smoking bans.

I was executive director of the Beverly Hills Restaurant Association during that period of time when Beverly Hills had a city-imposed smoking ban, so I have very relevant experience in matters involved with the bill before you.

Mr. Chairman and members of the subcommittee, unfortunately we in California have had first-hand experience with government imposed smoking bans. They do not work. Our customers do not care to dine in smoke-free restaurants.

We do not need to experiment with a national smoking ban to see what would happen. We already have a clear and absolute case-study of what happens when smoking is banned in restaurants.

Beverly Hills tried a smoking ban and it was a disaster. First, the city council of Beverly Hills unanimously passed a total smoking ban. Seven months later, they unanimously repealed the ban.

The Beverly Hills City Council was under direct and heavy pressure. That pressure came—not from the tobacco industry as some have said—but from restaurants in Beverly Hills who were losing business. When the smoking ban was repealed, our customers came back.

In Los Angeles, we can now document the business losses from that city's recently imposed smoking ban. A survey of 300 Los Angeles restaurants conducted for the Southern California Business Association and the Pacific Dining Car Restaurant now report that 55 percent of the restaurants surveyed have seen monthly revenue declines since the smoking ban. The average decline is almost 25 percent. That amounts to \$11,000 per month, per restaurant reporting losses in the survey.

Restaurants run on too small a profit margin to be able to sustain the kinds of demonstrated losses government-imposed smoking bans cause. We need all of our customers—smokers and nonsmokers. I have represented and shared experiences with restaurateur after restaurateur who vehemently oppose the government—at any level—imposing rules so they must tell customers not to smoke. We are and should remain an industry of accommodation.

Some have claimed support for H.R. 3434 because it would impose a "level playing field." That is, it would ban smoking nationally—so smokers would not be able to simply cross city or State lines to dine in a jurisdiction where smoking is permitted.

That notion, I believe, is naive. That idea ignores the American kitchen.

Dining at a restaurant is a social experience. Eating in a restaurant is a matter of choice—not only as to which restaurant to patronize, but whether to eat out or eat in. Many smokers, I believe, simply would choose to eat and entertain at home—one of the few bastions still preserved for their choice under this proposal. That takes business away from restaurants.

I know that some have indicated that H.R. 3434 would not require smoking bans. But, restaurants cannot realistically establish a separate smoking room with separately exhausted ventilation as required by the bill in order to permit smoking. And, the bill's requirement that smoking areas be set up in way that nonsmokers "do not have to enter for any reason", would seem to preclude the hiring of nonsmoking waiters, waitresses and other personnel even if walls and exhaust systems were changed.

Restaurateurs look to provide a comfortable and enjoyable dining experience. For some of our customers, part of that dining experience includes smoking. If restaurants believe that smoking bans will increase business, they ban smoking. Some have already done that. Most, however, continue to seek to provide a smoking section because that is what satisfies their customers.

Smokers and nonsmokers are already provided with separate sections in restaurants. Few nonsmoking patrons really object to smoking sections.

Please do not turn restaurant owners and managers into smoking police. We need to provide a positive dining experience. Please allow us to continue to do so. Forcing us to ban smoking is not the answer.

Thank you for your time. I would be happy to answer any questions you might have.

Mr. WAXMAN. Thank you, Mr. Cole. Mr. Naylor?

STATEMENT OF W.W. NAYLOR

Mr. NAYLOR. Thank you, Mr. Chairman. Members of the committee, Mr. Chairman, my home and office are in your district, as you know. It is an honor to appear before this committee and share some thoughts from the perspective of someone who makes his living in the hospitality industry.

My current interests include a growing chain of restaurants based in southern California and some developments overseas. I serve on the Board of the California Restaurant Association as past president. I am treasurer-elect of the National Restaurant Association and next year I will become vice president of the National Restaurant Association and president the year after.

However, my comments today are not on behalf of those organizations or any other, but as a private citizen. I should add that I

am not particularly a fan of smoking. I don't smoke and never have. I don't make any money off the sale of cigarettes. My customers can smoke, even though I do business in the tightly controlled smoking atmosphere of southern California, where new smoking restrictions pop up every day.

But I found an easy solution. Each of our locations has a large outdoor patio and dining area where people can smoke. But all that is beside the point. Reasonable people may disagree about how good or bad the habit of smoking might be, but bad law is another thing entirely. This bill is just bad law.

First, this is a government mandate, at a time when we need another mandate like we need another earthquake. The most troublesome mandate, of course, is the provision in the President's health care bill that requires all employers to pick up the cost of health insurance for their employees.

Even the Congressional Budget Office estimates the health care employer mandate will lead to a loss of a million or more jobs—many of them restaurant workers. And yet Congress seeks to impose more mandates which will cost us money, jobs, and liberty.

As for the non-smoking mandate in this legislation, there are many reasons to oppose it. Again, it has nothing to do with how you feel about smoking. For one thing, it makes it harder for restaurant owners and managers to meet the demands of their customers. For another, it is one more example of the Federal Government getting involved in issues which are better resolved without government interference. If government truly needs to address them, surely these issues are better left to State and local governments.

In any event, you've got to think it would be inconceivable to a John Adams or a Thomas Jefferson that the Federal Government were even considering a bill such as the one before us today. We are not, after all, known as the "Land of the Safe" or "The Home of the Risk-Free." Not yet, at any rate.

Today, in this brave new world, a parade of special interests comes here in support of this legislation. And they come for many reasons. But they each come with their own self-interests—usually financial—in mind.

Some quick service restaurants which have banned smoking are afraid of competition from those which have not. Building owners and managers are concerned that responsibility for acceptable air quality might be laid entirely at their door. After all, maintaining, cleaning and operating ventilation systems costs money.

Of course, the usual parade of anti-smokers and tobacco company representatives come here saying the usual predictable things. I cannot help but think that somehow through it all we've lost our perspective. There is something terribly wrong in this Nation when the Surgeon General suggests we consider legalizing cocaine and heroine, but supports a ban on smoking in public. It might be funny if it weren't so tragic. So what are we to make of the controversy surrounding secondhand smoke?

Well, several others testifying today have held themselves out as experts on the potential health effects of secondhand smoke, I will not do so. I will offer one observation from the perspective of a

businessman. I have heard reports on both sides of the issue. I am sure the experts will continue to debate it.

However, my concern right now is that there are still restaurant customers who wish to smoke and the survival of our business may depend, at least to some extent, on being able to meet that demand. I see no good reason to have Washington step in and prohibit us from doing so.

Finally, the most important piece is apparently lost in all this. What is it that the people of this country really want? For one thing, I think they would like to see Congress and the President dealing with more important issues. For another, they would like to see this body conduct itself with a little more tolerance and reasonableness.

I have never seen a public opinion poll in which smoking is listed in even the top five or six concerns of the American people. They are concerned about things like jobs, crime and education. In fact, a CNN poll released Tuesday showed a majority of Americans, smokers and non-smokers, think designated areas should be provided, and that is a sufficient answer to the problem.

Why is it that this Congress seems bent on imposing restrictions on our citizens that they clearly do not want? Whose interests are being represented? This legislation ought not to pass for the basic reason that it's bad for business. It further erodes our liberty. It is another unnecessary mandate. The American public seems satisfied with simpler and easier solutions.

I leave you with the words of one of our Founding Fathers, Benjamin Franklin, who said "He who would exchange liberty for security deserves neither."

Thank you, Mr. Chairman.

Mr. WAXMAN. Thank you very much, Mr. Naylor. Dr. Coggins?

STATEMENT OF CHRIS COGGINS

Mr. COGGINS. Mr. Chairman, thank you. I have an exhibit. Would it be possible for one of the aides to put the exhibit on the stand? Thank you.

Mr. Chairman, ladies and gentlemen, good afternoon. My name is Dr. Chris Coggins. I'm a Board-certified toxicologist with the J.R. Reynolds Tobacco Company. I have just come from a scientific symposium on ETS in Dallas. There I reviewed some experimental data from an animal inhalation study, where there were no meaningful changes with massive ETS concentrations.

Today, however, I will review an even more basic issue, one that is at the heart of the smoking ban legislation. What are the amounts of ETS that non-smokers are, in fact, exposed to? I will then also explain some of the significant flaws in the epidemiology data that the EPA report on ETS is based on.

Could I go back two sentences?

Mr. WAXMAN. Please.

Mr. COGGINS. Today, however, I will review an even more basic issue, one that is at the heart of the smoking ban legislation. What are the amounts of ETS that non-smokers are, in fact, exposed to? Then I will also explain some of the significant flaws in the epidemiology data that the EPA report on ETS is based on.

Just how much smoke are non-smokers exposed to? The so-called fact sheet prepared by members of the subcommittee staff does not present an accurate picture of how much ETS is in the air. A review in 1993 examined measurements of air quality in 951 smoking and 905 nonsmoking homes. The average concentration of respirable suspended particulates was 22 micrograms per cubic meter for the nonsmoking homes and 49 micrograms per cubic meter for smoking, giving an average difference that is presumably due to smoking of 27 micrograms. That is 27 millionths of a gram per cubic meter. That's a vanishingly small number.

This reviewer then calculated the daily intake for the maximum ETS exposed person. This is someone who is exposed at home, while traveling, who works in a bar, and who is also exposed in other public places. The value obtained was around 60 micrograms per day.

Now, if one were to assume that ETS and mainstream smoke were the same, although we know, however, that because of aging and dilution, they are very different, if we were to assume they were the same, these numbers translate to about one to four cigarette equivalents per year.

Now, one of the basic tenets of toxicology is that the dose makes the poison. Such tiny members as micrograms per cubic meter from one to four cigarettes per year represents such trivial doses that it is scientifically implausible that they could result in meaningful toxicological activity.

It is, therefore, inconceivable that public policy calling for virtual bans on smoking will be necessary to reduce exposure to such a negligible risk.

Moving on to my chart and the epidemiology, the EPA has a set of clear guidelines relating to risk assessment. Among other things, these guidelines state that epidemiological studies are inherently capable of detecting only comparatively large increases in the relative risks of cancer. The guidelines further require EPA to evaluate the strength of the reported associations.

There are two sets of epidemiology data in the EPA report. These studies produce odds ratios. The odds for disease occurrence in exposed people divided by the odds for disease occurrence in non-exposed people. An odds ratio of one indicates no increase in risk. Ratios below about three are considered to be weak. The 31 worldwide epidemiology studies in the EPA report had odds ratios that were maximally $2\frac{1}{2}$ most were considerably less. The medical average was $1\frac{1}{2}$.

The analysis of the 11 U.S. studies proved an odds ratio of 1.19. Regardless of your views on ETS, these reported associations must be considered weak. Now, epidemiologists cautiously interpret such weak associations because of the influence of confounding factors, agents other than the one on study that are also linked with the disease being studied.

The EPA's guidelines also recognize that a prerequisite for accepting a causal relationship is that the possibility of confounding has been considered and ruled out. The data do not permit confounding to be ruled out. Importantly, in neither of the two sets of epidemiology data constructed by the EPA was there sufficient control for other known risk factors for lung cancer.

Since the strengths of the associations were so weak, the required amount of confounding by other risk factors to explain that association would not need to be large.

In my exhibit, I show some of the many known risk factors for lung cancer. The references to these studies are in my testimony. I indicate on this chart in red some of the major risk factors, such as TB and occupational exposure and a high saturated fat diet. Weaker risk factors, shown in yellow, include keeping pet pigeons, milk consumption, and low physical activity.

I calculate that the odds ratios associated with exposure to ETS, shown in magenta, and, in fact, that's actually not ETS, that's being married to a smoker, shown in my exhibits is 25 to 55-fold less than that for a high saturated fat diet. Failure to control for such a large factor could easily account for the small elevation in risk associated with ETS.

To conclude, the amounts of ETS that non-smokers are likely to be exposed to are vanishingly small and, as such, two, they are unlikely to be biologically meaningful. Finally, the reported association between ETS and lung cancer could easily be the result of confounding, given that it is such a weak association.

Thus, any effort to ban smoking in all work places and public buildings amounts to regulatory overkill, motivated not by sound, objective science, but by political considerations of what constitutes correct behavior. If this subcommittee is to approve H.R. 3434, at least be honest enough to the fact that emotion, not science, rules the day on public policy matters relating to ETS.

Thank you.

[The prepared statement of Mr. Coggins follows:]

Good morning ladies and gentlemen. My name is Dr. Chris Coggins. I am a Principal Scientist with the R. J. Reynolds Tobacco Company. I am also a Board Certified Toxicologist. I have just come from a scientific symposium entitled "*Environmental tobacco smoke: scientific and societal issues*" held by the Society of Toxicology in Dallas. There, I reviewed experimental data from an animal study, where there were no meaningful changes with massive ETS concentrations.

Today however I will review an even more basic issue, one that is at the heart of the smoking ban legislation: what are the **amounts of ETS** that nonsmokers are in fact exposed to? Time permitting, I will then explain some of the significant flaws in the **epidemiologic data** that the EPA report on ETS is based on.

NONSMOKERS ARE EXPOSED TO MINUTE CONCENTRATIONS OF ETS.

Just how much smoke are nonsmokers exposed to ? The

so-called fact sheet, prepared by members of the subcommittee staff, does not present an accurate picture of how much ETS is in the air. A review ⁽¹¹⁾ in 1993 examined measurements of air quality in 951 "smoking" and 905 "nonsmoking" homes. The average concentrations of respirable suspended particulates were 22 micrograms (millionths of a gram:there are 450 grams in a pound) per cubic meter (yard) for "nonsmoking" and 49 micrograms per cubic meter for "smoking", giving an average difference (that is presumably due to smoking) of 27 micrograms per cubic meter. A vanishingly small number.

The same review showed similarly small differences between "smoking" and "nonsmoking" offices, public buildings, restaurants and transportation. The reviewer then calculated the daily intake for the "maximally ETS-exposed person". This is someone that is exposed at home and while traveling, who works in a bar, and is also exposed in other public places. The value obtained was around 60 micrograms, per day. Now if one were to assume that ETS and mainstream smoke were the same (we know however that because of aging and dilution, they are very different), these numbers translate to about 1-4 cigarette-equivalents

per year.

One of the basic tenets of toxicology is that "the dose makes the poison". All things are poisons, depending on the dose. Such tiny numbers as "micrograms per cubic meter" and "1-4 cigarettes per year" represent such trivial doses that it is scientifically implausible that they could result in meaningful toxicological activity. In fact, animals exposed at concentrations hundreds of times higher than those seen in homes and offices where smoking takes place show no meaningful changes at all ⁽¹⁾. It is therefore inconceivable that public policy, calling for virtual bans on smoking, would be necessary to reduce exposure to such a negligible risk.

THE ETS EPIDEMIOLOGY STUDIES REPORT WEAK ASSOCIATIONS THAT ARE NOT CONTROLLED FOR CONFOUNDERS

The EPA has a set of clear guidelines relating to risk assessment ⁽²⁾. Among other things, these guidelines state that "*epidemiological studies are inherently capable of detecting only comparatively large increases in the relative risk of cancer*". The guidelines further require EPA to

evaluate the strength of the reported associations.

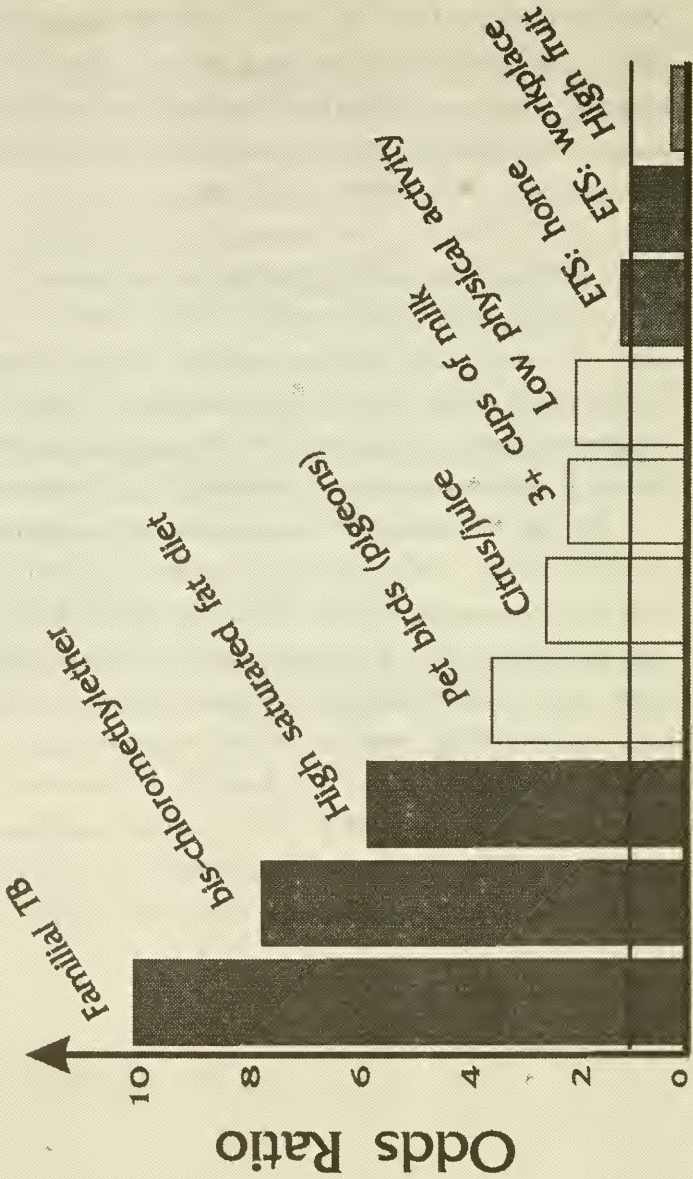
There were 2 sets of epidemiology data in the EPA report linking ETS exposure in nonsmokers with lung cancer. These studies produce odds ratios: the odds for disease occurrence in exposed people, divided by the odds for disease occurrence in nonexposed people. An odds ratio of 1 indicates no increase in risk; ratios below about 3 are considered to be **weak** ⁽³⁾. The 31 worldwide epidemiology studies had odds ratios that were maximally 2½ (most were considerably less, the arithmetical average being about 1½); the meta-analysis of 11 US studies produced an odds ratio of 1.19. Regardless of your views on ETS, these reported associations must be considered weak.

Epidemiologists cautiously interpret such weak associations, because of the influence of confounding factors: agents other than the one on study, that are also linked with the disease being studied. The EPA's guidelines also recognize that a prerequisite for accepting a **causal** relationship is that *"the possibility of confounding has been considered and ruled out as explaining the association"*. The data do not permit confounding to be ruled out.

Importantly, in neither of the two sets of epidemiology data constructed by the EPA was there sufficient control for other known risk factors for lung cancer. Since the strengths of the associations were so weak, the required amount of confounding (by other risk factors) to explain that association would **not** need to be large.

In my exhibit I show some of many known risk factors for lung cancer, the major ones (in red) including a family history of tuberculosis ⁽⁴⁾, occupational exposure to bis-chloromethylether ⁽⁵⁾, and a high saturated fat diet ⁽⁶⁾. Weaker risk factors (shown in yellow) include keeping pet pigeons ⁽⁷⁾, milk consumption ⁽⁸⁾, and low physical activity ⁽⁹⁾. I calculate that the odds ratios associated with exposure to ETS (actually, "being married to a smoker"), shown in my exhibit in magenta, is 25 to 55 fold less than that for a high saturated fat diet. Failure to control for such a large factor could easily account for the small elevation in risk associated with ETS. Note on the chart (in green) the protective effect of a high fruit diet ⁽¹⁰⁾. Put simply, confounding cannot be ruled out as explaining the association between ETS exposure and lung cancer.

Some Risk Factors for Lung Cancer



To conclude, (1) the amounts of ETS that nonsmokers are likely to be exposed to are vanishingly small, and (2), as such they are unlikely to be biologically meaningful. Finally, (3), the association between ETS and lung cancer could easily be the result of confounding, given that it is such a weak association.

Thus any effort to ban smoking in all workplaces and public buildings amounts to regulatory overkill, motivated not by sound, objective science but by political considerations of what constitutes correct behavior. If this subcommittee is to approve HR 3434, at least be honest enough to own up to the fact that emotion - not science - rules the day on public policy matters relating to ETS.

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Mr. WAXMAN. Thank you very much. After this, I do have some questions for this panel, we're going to break for lunch. Mr. Banzhaf has a time schedule and I asked him if he would join this panel and give his testimony at this point.

STATEMENT OF JOHN F. BANZHAF III

Mr. BANZHAF. Thank you very much, Mr. Chairman. My name is John Banzhaf. I'm executive director of Action on Smoking and Health, although after listening to my distinguished scientific colleague, I think we've been barking in the wrong direction for 25 years and we ought to be Action on Pigeons and Health or Action on Citrus Juice and Health, because that's really the major problem of lung cancer in the United States.

As the attorney who first started what is now known as the non-smokers' rights movement by taking legal action way back in 1969 to get no-smoking sections on airplanes and who has been involved in countless, mostly successful legal proceedings since that time, fighting on behalf of what we call the involuntary smokers, I am proud and delighted to testify in support of what I see as the major logical culmination of that battle and the major first step in attacking the Nation's health care crisis.

Mr. Chairman, what I see this morning makes it clear. What was once regarded as the mark of a militant has now become the mandate of mainstream America, a demand to be fully protected from the proven health hazards of secondhand tobacco smoke by banning it.

Today the public accepts, as every major independent entity and organization which has examined the issue has reported, that secondhand tobacco smoke kills non-smokers. It, therefore, accepts, since tobacco smoke is a Group A carcinogen, just like benzene or asbestos, for which there is no safe lower limit, that smoking indoors in places open to the public must be prohibited.

After all, we would never dream of having a benzene and non-benzene section in a restaurant or asbestos and non-asbestos sections in offices. That's why demands for smoke-free air have gone from radical and reactionary to reasonable, responsible and realistic, and why ashtrays are rapidly going the way of spittoons.

Here is the proof. Recent surveys showed that $\frac{1}{3}$ of all employees already work in buildings where smoking is prohibited. McDonald's, Taco Bell, Arby's, a number of other fast food restaurant chains have banned smoking in their restaurants, as well as their corporate headquarters.

Mr. Chairman, what could be more mainstream and middle America than McDonald's? A survey by Taco Bell, which just yesterday banned all smoking, showed that a majority, $\frac{3}{4}$ of their smoking customers were in favor of it. The Department of Defense, which has never been noted for being a hot bed of radicalism or for even being out in front on social issues, has now banned smoking.

Now, Maryland has banned workplace smoking, and this is a tobacco-growing State. There's been almost no editorial opposition. The State of Washington has likewise banned it. The Food and Drug Administration is finally seriously considering regulating cigarettes, something we asked them do about 15 years ago. We were ahead of our time. It's a move which, of course, could place

greater restrictions on smokers, and, yet, it is being considered seriously.

In major cities around the country, smokers must now go outside to smoke; in the rain, as well as in the cold of winter, in the heat of summer. But there are virtually no protests, no marches, no sit-ins, no major objections. An article about to appear in the April issue of the Journal of Applied Psychology reports that smokers are generally willing to accept restrictions and bans when the reasons are explained.

Indeed, Mr. Chairman, the support for smokers' rights, this concept we hear so much about, has really enjoyed underwhelming support. I'm sure you all remember the first Smokers' March on Washington last September. It was brought by those people who are fighting tobacco-related discrimination. They had 45 adults, 5 children and 3 dogs, about twice the number of people who marched in the Ku Klux Klan parade.

Freedom Air, that widely touted airline that would let smokers smoke on domestic flights, has now gone out of business. They had only two paying customers on their inauguration flight.

So the issues of protecting the rights of non-smokers are now no longer if or whether, but rather when and how. ASH believes the answer, as you do, should be now and uniformly. If Congress fails to act, non-smokers will no doubt continue to triumph in individual legal proceedings, as we've been doing for the past 20 years. Other States will join Maryland and Washington and Vermont and Utah in banning smoking and business after business will follow the lead of others and adopt their own bans.

But in our increasingly interconnected economy, workers and travelers should not be subjected to a bewildering variety of different restrictions on smoking, but the resulting limitations on job mobility, on certainty of application and confusion and other problems of enforcement.

Smoking is the Nation's number one preventable health problem, with more non-smokers dying each year than virtually all of the other diseases.

Finally, Mr. Chairman, since it might not be clear that the representative from Healthy Buildings who will follow me is hardly independent, but can more accurately be characterized as a spokesman for the tobacco industry front, I would like to submit for the record at this point a transcript of an expose of that organization by the NBC Nightly News, an article in The Nation newspaper, and the Indoor Air Review for inclusion in the record.

Mr. WAXMAN. Without objection, we will receive that for the record.

[Testimony resumes on p. 369.]

[The prepared statement and attachments of Mr. Banzhaf follow. Certain other attachments are retained in the file record of the subcommittee.]



ACTION ON SMOKING AND HEALTH

2013 H St., N.W. • Washington D.C. 20006 • (202) 659-4310

TESTIMONY OF JOHN F. BANZHAF III
 PROFESSOR OF LAW AT THE GEORGE WASHINGTON UNIVERSITY AND
 EXECUTIVE DIRECTOR AND CHIEF COUNSEL OF ACTION ON SMOKING AND HEALTH (ASH)
 A NATIONAL NONPROFIT SCIENTIFIC AND EDUCATIONAL ORGANIZATION
 BEFORE THE SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
 OF THE U.S. HOUSE OF REPRESENTATIVES
 THURSDAY, MARCH 17, 1994
 ON THE SMOKE-FREE ENVIRONMENT ACT OF 1993 (H.R. 3434)

Mr. Chairman and Members of the Committee:

As the attorney who first started what is now known as the nonsmokers' rights movement by taking legal action in 1969 to get no-smoking sections on airplanes, and who has been involved in countless mostly-successful legal proceedings since that time fighting on behalf of so-called "involuntary smokers," I am proud and delighted to testify in support of what I see as the logical culmination of that battle, and a major first step in attacking the nation's health care crisis.

What was once regarded as the mark of a militant has now become the mandate of mainstream America: a demand to be fully protected from the proven health hazards of secondhand tobacco smoke by banning it.

Today the public accepts — as every independent agency or organization which has examined the issue has reported — that secondhand smoke kills nonsmokers.¹

It therefore also accepts — since tobacco smoke is a "Group A Carcinogen" like benzene or asbestos for which there is no known safe lower limit — that smoking indoors in places open to the public must be prohibited.

After all, we would never dream of having "benzene" and "no-benzene" sections in restaurants, nor would we long tolerate "asbestos" and "no-asbestos" sections in offices.

That's why demands for smoke-free air have gone from radical and revolutionary to reasonable, responsible, and realistic — and why ashtrays are rapidly going the way of spittoons. Here's proof:

- A recent survey shows that about a third of all employees already work in buildings where smoking is banned.

- McDonald's, Taco Bell, Arby's and a number of other fast-food corporations have banned smoking in their corporate headquarters as well as in the outlets they control — and what could be more mainstream and middle American than McDonald's.

- A survey by Taco Bell showed that almost three-fourths of its smoking customers supported the total ban.

- The Department of Defense — never noted for being a hotbed of radicalism or for being out in front on social issues — has also banned smoking.²

LEGAL ACTION AND EDUCATION ON THE HAZARDS OF SMOKING • PROTECTING THE RIGHTS OF THE NONSMOKING MAJORITY

■ Maryland has banned workplace smoking throughout the tobacco-growing state — and the move has created little editorial opposition.³

■ The State of Washington has likewise banned smoking in all office work environments.⁴

■ The Food and Drug Administration (FDA) is finally seriously considering regulating cigarettes — a move which could place even greater restrictions on smokers.⁵

■ Courts are routinely finding that tobacco smoke is a health hazard — nonsmokers are increasingly being compensated for injuries, and court orders prohibiting smoking anywhere around a child are being issued with growing frequency.

In major cities around the country smokers must go outside to smoke — in the rain, as well as in the cold of winter and the heat of summer. Yet there are virtually no protests, no marches, no sit-ins, or other serious objections.

As an article in the April issue of the *Journal of Applied Psychology* will report, smokers are generally willing to accept such restrictions when the reasons are explained.

Indeed, there has been positively underwhelming support for the concept of smokers' rights.

On September 25, 1993, the first national march in Washington to fight what supporters claim is "tobacco-related discrimination" drew only 45 adults, five children and three dogs.

"Freedom Air," a widely touted airline set up to permit smoking on domestic flights, is out of business — having garnered only two paying customers on its maiden flight.

The issues of protecting the rights of nonsmokers are no longer "if" or "whether" but rather "when" and "how." ASH believes the answers should be "NOW" and "UNIFORMLY."

If Congress fails to act, nonsmokers will no doubt continue to triumph in individual legal proceedings; other states will join Maryland, Washington, Vermont, and Utah in regulating smoking; and business after business will follow the lead of others and adopt their own bans.

But in our increasingly interconnected economy, workers and travelers should not be subjected to a bewildering variety of different restrictions on smoking — with the resulting limitations on job mobility, uncertainty of application, and confusion and other problems of enforcement.

Smoking is the nation's major national health problem, with more nonsmokers dying each year from secondhand smoke than from automobile accidents, and from guns, AIDS, and illicit drugs combined!

Smoking costs the American economy over \$100 billion each and every year.⁶

Therefore it should be treated uniformly at the national level — as we do with other worker-related problems like job safety, hiring discrimination, and sexual harassment.

The Smoke-Free Environment Act does exactly that, and with ever-growing support from the business community as well as the overwhelming majority of Americans who are nonsmokers.

Thank you — I would be happy to respond to any questions.



ASH

SPECIAL REPORT

ACTION ON SMOKING AND HEALTH

2013 H St., N.W. • Washington D.C. 20006 • (202) 659-4310

INVOLUNTARY SMOKING: The Factual Basis for Action

"INVOLUNTARY SMOKING" or "PASSIVE SMOKING," sometimes even called "RESPIRATORY RAPE" — it all means the same thing: being forced to inhale other people's tobacco smoke.

Today we know that this substance, now called "Environmental Tobacco Smoke" (ETS) or "secondhand smoke," is the deadliest danger to which we are exposed. Indeed, it kills more Americans than all forms of air pollution, water pollution, food additives, and radiation combined; more than all automobile accidents, guns, AIDS, and illicit drugs — a staggering 53,000 innocent victims each and every year!

This document presents the major findings of the Environmental Protection Agency (EPA) Report on passive smoking and other recent studies in a form which can be used to convince business leaders, legislators, agency officials, judges, and others of the need to protect the majority of Americans who don't smoke (including all children) from the deadly effects of ETS.

This, the experts and the agencies tell us, can only be done by restricting smoking in all public places; there is no safe lower level for the dozens of dangerous chemicals in tobacco smoke which drift and are recirculated, and cannot be filtered out or otherwise eliminated by even the finest ventilation systems.

Please help to make this life-saving information as widely available as possible. Feel free to duplicate all or part of this comprehensive reference work, or to request additional copies from ASH. [\$2/each]

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PAGE 2 presents the official findings of five government agencies that ETS causes lung cancer in nonsmokers

PAGE 3 answers commonly asked questions about how we know that ETS causes lung cancer in nonsmokers

PAGE 4 explains how ETS is the third major U.S. killer, how it kills over 50,000 Americans each year

PAGE 5 answers the tobacco industry's major arguments concerning ETS studies, and provides three questions which should be asked of any witnesses defending ETS

PAGE 6 describes how ETS creates very serious health hazards for all children, and cites the major studies

PAGE 7 explains how courts protect children from ETS through court orders and through custody decisions

PAGE 8 notes what major newspapers and organizations are saying and doing concerning public smoking

PAGE 9 indicates the legal theories under which owners and employees are being held liable for permitting smoking, and cites some of the major legal decisions

PAGES 10-14 reprint of the complete verbatim text of the EPA Report's "Summary and Conclusions"

PAGE 15 reprints additional important information from the EPA Report, including additional citations

PAGE 16 tells what you can do to protect yourself and others, and where to get additional information

What We Know About ETS Today

Environmental tobacco smoke (ETS) is a "Group A Carcinogen" like asbestos and benzene — one of the few substances known to cause cancer in humans and for which there is no safe lower limit. Each year it kills:

- an estimated 53,000 Americans:
- more people than all the victims of automobile accidents, including those caused by drunken drivers;
- more than twice as many people as all homicides, including homicides caused by firearms;
- more than twice as many people as AIDS;
- more than ten times as many people as all the illicit drugs we target in our "war on drugs"

ETS presents even greater dangers to children. Each year, even at the levels found in a home where only one parent smokes, it is estimated to cause in infants:

- 150,000-300,000 lower respiratory infections like pneumonia and bronchitis
- 7,500-15,000 hospitalizations
- 200,000-1,000,000 asthma attacks
- 8,000-26,000 new cases of asthma
- increased middle ear effusion
- respiratory symptoms of irritation
- significantly reduced lung function
- a large increase in the risk of death from S.I.D.S.





Official findings that ETS causes lung cancer

ENVIRONMENTAL PROTECTION AGENCY

"Environmental Tobacco Smoke (ETS) is one of the most widespread and harmful indoor air pollutants. ETS comes from secondhand smoke exhaled by smokers and sidestream smoke emitted from the burning end of cigarettes, cigars, and pipes.

ETS is a mixture of irritating gases and carcinogenic tar particles. It is a known cause of lung cancer and respiratory symptoms, and has been linked to heart disease. Breathing in ETS is also known as "involuntary" or "passive smoking."

Environmental tobacco smoke can be totally removed from the indoor air only by removing the source (cigarette smoking) . . .

Placing smokers and nonsmokers in separate rooms that are on the same ventilation system also may reduce nonsmokers' exposure to tobacco smoke; this approach, however, will probably not eliminate exposure to tobacco smoke since most pollutants readily disperse through a common air space and since, in public or commercial buildings, most HVAC systems recirculate most of the contaminated indoor air." [Indoor Air Facts: Environmental Tobacco Smoke, EPA Bulletin No. 5, June, 1989]

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

"ETS meets the criteria of the Occupational Safety and Health Administration (OSHA) for classification as a potential occupational carcinogen [Title 29 of the Code of Federal Regulations, part 1990].

NIOSH therefore considers ETS to be a potential occupational carcinogen and recommends that exposures be reduced to the lowest feasible concentration.

All available preventive measures

should be used to minimize occupational exposure to ETS." [Current Intelligence Bulletin 54 (CIB 54), entitled "Environmental Tobacco Smoke in the Workplace," p. iii.]

"Workers should not be involuntarily exposed to tobacco smoke." To prevent worker exposures to any hazardous substances, employers should first eliminate hazardous workplace emissions at their source. . . .

Therefore, the best method for controlling worker exposure to ETS is to eliminate tobacco use from the workplace and to implement a smoking cessation program." [Id, p 12]

ANY OPPOSED?

Every governmental, scientific, or medical organization which has examined the issue has concluded that ETS causes lung cancer and lung cancer deaths in nonsmokers.

Indeed, only the tobacco industry and people with financial ties to the industry have publicly questioned this finding of more than a dozen different prestigious organizations.

U.S. SURGEON GENERAL

"1. Involuntary smoking is a cause of disease, including lung cancer, in healthy nonsmokers.

2. The children of parents who smoke compared with children of nonsmoking parents have an increased frequency of respiratory infections, increased respiratory symptoms, and slightly smaller rates of increase in lung functions as the lung matures.

3. The simple separation of smokers and nonsmokers within the same air space may reduce, but does not eliminate, the exposure of nonsmokers to ETS." [1986 Report]

"The relationship between lung cancer

among nonsmokers and ETS has been documented in both case-control and longitudinal studies. Most of these studies have measured the increased risk of lung cancer among nonsmoking women, usually wives exposed to their husband's tobacco smoke.

A 1.3-Fold increased risk of lung cancer has been estimated from these studies and is consistent with the amount of exposure to carcinogens from ETS, the duration of exposure, and the differences in distribution of potential carcinogens between sidestream and mainstream smoke." [1989 Report, p. 77-78]

NATIONAL RESEARCH COUNCIL

of the National Academy of Sciences

"The weight of evidence derived from epidemiological studies shows an association between ETS exposure of nonsmokers and lung cancer that, taken as a whole, is unlikely to be due to chance or systematic bias. . . .

1. A summary estimate from epidemiological studies places the increased risk of lung cancer in nonsmokers married to smokers compared with nonsmokers married to nonsmokers at about 34%." [Environmental Tobacco Smoke: Measuring Exposures and Assessing Health Effects (1986)]

NATIONAL CANCER INSTITUTE

"It is the official position of this Department that nonsmoker exposure to tobacco smoke, at those levels commonly found in indoor environments where smoking is permitted, increases the risk of lung cancer and possibly other chronic diseases. We know of no valid arguments to the contrary." [Letter from Peter Greenwald, M.D., Dir. of Cancer Prevention and Control, 10/14/90]



How we know ETS causes lung cancer

Q: How do we establish that a substance causes cancer?

A: Usually, because the cancer-causing effects are so small, scientists subject laboratory animals to doses hundreds or thousands of times the equivalent of human exposure. Then we see if there is an increase in the incidence of cancer.

In some cases we have been able to observe the effects of very high doses directly on humans; e.g., uranium workers exposed to radon. In both cases, because we have never found a safe level below which a carcinogen doesn't cause cancer, we must assume — until proven otherwise — that it can cause cancer in any concentration.

Q: Does this mean we usually have no studies showing that a chemical causes cancer at the levels at which it is normally encountered?

A: That's right — such studies are usually not available. For example there are no studies showing that radon at typical levels found in homes causes cancer.

The same is true for most of the other carcinogens regulated by various agencies. Fortunately, these normal-level (so called "epidemiological") studies are available for ETS, and show what happens at typical ETS levels in homes.

Q: Is there any evidence, in the absence of these epidemiological studies, which shows that ETS causes cancer?

A: Yes, many different types:

FIRST, more than 40 individual chemicals present in ETS have independently been found to cause cancer, and there is obviously no reason to believe that they lose their cancer-causing properties when mixed with other toxins in ETS.

"ETS is a human lung carcinogen, responsible for approximately 3,000 lung cancer deaths annually in U.S. nonsmokers." [EPA Report at 1-1.]

SECOND, thousands of studies have demonstrated that mainstream tobacco smoke — which contains virtually the same chemicals as ETS — causes cancer in the lungs of smokers, as well as in animals such as mice and rats.

THIRD, numerous studies show that nonsmokers absorb large amounts of these chemicals into their bodies — in some cases the equivalent of a pack a day — even if they are seated in nonsmoking sections, and that they retain the chemicals for long periods of time.

THUS, this evidence even by itself is far stronger than that under which most carcinogens are regulated. As the U.S. Surgeon General said in his 1986 Report: "In examining a low-dose exposure to a known carcinogen, it is rare to have such an abundance of evidence on which to make a judgment, and given this abundance of evidence, a clear judgment can now be made: exposure to [ETS] is a cause of lung cancer."

Q: How were the epidemiological studies [listed on page 15] done?

A: The studies examine comparable groups of people to see if the one regularly exposed to ETS had higher rates of lung cancer than the one which was not. In virtually all cases, those exposed to ETS had higher lung cancer rates than those who were not exposed. Moreover, where it was possible to measure the amounts of the exposure, those with the most exposure generally had the highest rates of lung cancer.

Q: How do we know that other things didn't cause the higher rates?

A: Individual researchers and EPA scientists looked for these other factors, but found none which could explain the higher rates in the many different studies in so many different countries.

Also it is unlikely that any of these other causes would have increased directly in proportion to ETS exposure.

Q: How strong is the evidence that ETS causes lung cancer and lung

cancer deaths in nonsmokers?

A: The evidence today is far stronger and more conclusive than with regard to virtually any other chemical.

In 1986 the National Academy of Sciences — an official and impartial body established by Congress — unanimously concluded that ETS caused lung cancer in humans. The same year the U.S. Surgeon General reached the same conclusion. [see page 2]

Indeed, numerous other scientific and medical organizations reached exactly the same conclusion even prior to the EPA Report, and none has ever reached the opposite conclusion. [see page 2]

Q: Could the EPA have been biased?

A: The EPA Report was prepared by a large number of scientists with the help of consultants from many different independent organizations. It was then subjected to scrutiny — including public hearings open to all critics and objectors — by a Science Advisory Board (SAB) composed of other scientists.

Even though almost half of the members of the SAB, including its chairman, admitted to having direct financial ties to the tobacco industry, the SAB nevertheless unanimously agreed with the EPA that ETS caused cancer in humans.

Besides, alleged bias by the EPA can't explain why every other scientific body both here and abroad which examined the issue reached the same conclusion.

Q: Is 3000 a large number of deaths?

A: Yes. It is more than 30 times those estimated to be caused by all EPA-regulated cancer-causing chemicals. [see box below]

Annual Cancer Deaths

Asbestos	15/yr
Vinyl chloride	<27/yr
Airborne radionuclides	17/yr
Coke-oven emissions	<15/yr
Benzene	8/yr
Arsenic	<5/yr

Source: Repace, Rusk Analysis, V. 10, No. 1, 1990



ETS is the third major U.S. killer

The EPA Report concluded that ETS causes approximately 3000 nonsmoker deaths annually from lung cancer, but that's only the tip of the iceberg.

Actually, other studies noted by the EPA strongly suggest that ETS causes 53,000 U.S. deaths each year, making it the third major killer — after active smoking (by smokers) and alcohol!

It is not surprising that passive smoking causes diseases other than lung cancer, or that lung cancer was the first disease definitively linked to ETS. The same thing happened with regard to active smoking.

"an estimated 53,000 Americans die each year from exposure to tobacco smoke of others." Dr. Antonia C. Novello, U.S. Surgeon General

Annual Deaths, Passive Smoking

Heart Disease	37,000
Lung Cancer	3,700
Other Cancers	12,000
TOTAL	~ 53,000

SOURCE: Glantz, et al., *Passive Smoking and Heart Disease*, Circulation, 1991;83:1-12; see also Wells, An estimate of adult mortality in the U.S. from passive smoking, *Environ Int* 1992;6:518.

The original Surgeon General's report concluded that smoking caused lung cancer in smokers. Only later did we realize that it also causes heart attacks, and cancer at many other sites. This also appears to be happening with ETS.

The EPA Report stated: "While this report focuses only on the respiratory health effects of passive smoking, there also may be other health effects of concern. Recent analyses . . . suggest that ETS exposure may be a risk factor for cardiovascular disease. . . . If it is, the total public health impact from ETS will be greater than that discussed here."

A recent analysis of almost a dozen epidemiological studies concluded that ETS increased the risk of heart attack

among people living with smokers.

In addition the principal author [Glantz] noted that since smokers are much more densely packed in an office than they are in most houses, "we are almost certainly underestimating the risks" of workplace smoking.

The epidemiological studies upon which the article was based are believed to be particularly reliable because they generally show a "dose-response" effect, with higher exposure causing a higher risk of heart attack. This tends to show that it is the ETS — and not some other factor — which is causing the deaths.

The study also outlines at least five ways in which ETS contributes to heart attacks.

First, the transportation of oxygen to red blood cells is immediately hampered by the carbon monoxide (CO) in ETS. The CO replaces the oxygen which is ordinarily carried by the red blood cells.

Second, other studies show that the blood not only does not carry the oxygen as well, but also that the oxygen which does get to the heart isn't used by the heart muscle to do work as efficiently.

Third, there's evidence that ETS makes blood platelets abnormally "sticky," and thus more likely to aggregate and form blood clots.

Fourth, while increased platelet aggregation plays a direct role in heart attacks, it also contributes to the development of atherosclerotic plaques, the fatty deposits on the walls of coronary arteries which often lead to heart attacks.

Fifth, components of ambient tobacco smoke may damage the delicate inner walls of coronary arteries, and initiate or accelerate development of these plaques.

In the next column are the major epidemiological studies linking ETS to heart attacks. Immediately following are studies which suggest that ETS causes cancers other than lung cancer.

BUTLER, The relationship of passive smoking to various health outcomes among Seventh-Day Adventists in California, *Seventh World Conference on Tobacco and Health* 1990;316 • GARLAND, et al., Effects of Passive Smoking on Ischemic Heart Disease Mortality of Nonsmokers, *Am J Epidemiol* 1995;121:645-650 • GILLIS, et al., The Effect of Environmental Tobacco Smoke in Two Urban Communities in the West of Scotland, *Euro J Resp Dis* 1994; 65(Suppl. 133):121-126 • HE, Women's passive smoking and coronary heart disease, *Chung-Hua-Yo-Fang-Hsueh-Ts-Chia* 1989; 23:19-22 • HELSING, et al., Heart Disease Mortality in Nonsmokers Living With Smokers, *Am J Epidemiol* 1988;127:915-922 • HOLE, et al., Passive smoking and cardiovascular health in a general population in the west of Scotland, *Br Med J* 1989;299:423-427 • HUMBLE, Passive smoking and twenty year cardiovascular disease mortality among nonsmoking wives in Evans County, Georgia, *Am J Public Health* 1990; 80:599-601 • LEE, et al., Relationship of Passive Smoking to Risk of Lung Cancer and Other Smoking-Associated Diseases, *Br J of Cancer* 1986;54:97-105 • HIRAYAMA, T., Lung Cancer in

Annual Deaths, Various Causes

Active Smoking ¹	434,000
Alcoholic Beverages ²	105,000
Passive Smoking ³	53,000
Auto Accidents ⁴	43,500
Homicides ⁵	24,020
AIDS ⁶	22,334
Fires ⁷	4,200
Radon, to nonsmokers ⁸	4,000
Cocaine & Crack ⁹	2,483
Heroin & Morphine ¹⁰	1,976

1 = U.S. Centers for Disease Control, 1988 • 2 = U.S. Centers for Disease Control, 1987 • 3 = U.S. Surgeon General, 1997 • 4 = Nat'l Safety Council, 1991 • 5 = U.S. Sen. Judiciary Comm. Rep., 1991 • 6 = U.S. Centers for Disease Control, 1991 • 7 = Nat'l Safety Council, 1991 • 8 = Repace, *Risk Anal.*, V. 10, No. 1, 1990, 27 • 9 = Nat'l Inst. on Drug Abuse, 1990 • 10 = Nat'l Inst. on Drug Abuse, 1990.

Japan. Effects of Nutrition and Passive Smoking, in *Lung Cancer: Causes and Prevention*, M. Mizell, et al., eds., pp. 175-179, Verlag Chemie Int'l, New York, 1984 • MARTIN, M. J., Increased Incidence of Heart Attacks in Nonsmoking Women Married to Smokers. Paper presented at annual meeting of American Public Health Association, 1986. • STEEDLAND, K., Passive Smoking and the risk of heart disease, *JAMA* (1973) 230:74-79 • SWENDSEN, et al., Effects of passive smoking the multiple risk factor intervention trial, *Am J Epidemiol* 1987;126:783-795

CANCERS: SLATTERY, et al., Cigarette Smoking and Exposure to Passive Smoke are Risk Factors in Cervical Cancer, *JAMA*, Vol. 261 (1), 155-159, May 1989 • HIRAYAMA, T., Cancer Mortality in Nonsmoking Women With Smoking Husbands Based on a Large-Scale Cohort Study in Japan, *Prev Med* 13(6):680-690, Nov, 1988 • GILLIS, et al., The Effect of Environmental Tobacco Smoke in Two Urban Communities in the West of Scotland, *Eur. J. Resp. Dis* 65(Suppl. 133):121-126, 1984 • REYNOLDS, et al., Passive Smoking and Cancer Incidence: Prospective Evidence from the Alameda County Study. Paper presented at the Society for Epidemiologic Research, Anaheim, May, June 1987 • MILLER, G.H., Cancers, Passive Smoking and Nonemployed and Employed Wives, *West J. Med* 140, 632-635, 1984 • SANDLER, et al., Passive Smoking in Adulthood and Cancer Risk, *Am. J. Epidemiol.* 121, 37-48, 1995



Answering tobacco industry arguments on ETS studies

The tobacco industry (TI) purports to find scientific flaws in the evidence that tobacco smoke causes cancer in non-smokers. However, since they also find flaws in the overwhelming evidence that tobacco smoke causes cancer in smokers, it is reasonable to doubt their impartiality and their scientific credibility on both issues. Nevertheless, here are some of their major arguments, and brief answers prepared by ASH.

TI: The EPA was biased.

ASH: It is very doubtful that the scientific body which reviewed and agreed with the EPA's conclusions was biased against tobacco, as almost half of its members admitted to having direct financial ties to the tobacco industry.

Since the more than a dozen governmental, scientific, and medical bodies which have reviewed the issue all agreed that ETS causes cancer, and no independent body has ever reached the opposite conclusion, it is far more likely that the tobacco industry's position is the one motivated by bias and self interest.

TI: Studies showing increased incidence of lung cancer from exposure to ETS in the home don't prove that ETS in the workplace or in public places likewise causes cancer.

ASH: There is no reason to believe that chemicals shown to cause cancer in one location would suddenly lose their cancer-causing properties in another.

Although no studies done in schools show that asbestos causes cancer, we don't allow children to go to school where asbestos is in the air.

TI: The EPA unscientifically relied on studies which were not statistically significant.

ASH: "Statistically significant," in this context, means that an individual study proves to at least a 95% probability that ETS causes lung cancer. While we sometimes need this very high degree of certainty before taking action, lower standards (e.g., 90%) are often used, and

have been accepted by courts. After all, should nonsmokers be subjected to a substance if we are only 90% (rather than 95%) certain that it causes lung cancer?

TI: The EPA unfairly combined different studies.

ASH: Many studies all pointing in one direction often prove causation to a far greater certainty than any single study.

Flipping a coin and having it come up heads 56 out of 100 tries only proves to about a 90% (not 95%) certainty that the coin is imbalanced. But if it keeps coming up heads more often than tails in study after study of 100-200 flips, the odds of that happening by chance become so small we can say with virtual certainty that something other than chance is causing it to favor heads.

Here, looking at different combinations of the larger and better studies, the EPA says the odds of the results occurring by mere chance range between 1 in 10,000 to 1 in 1,000,000,000. In other words, the EPA judged the overall statistical significance of the studies to be at least 99.99%!

TI: The answer to ETS problems is better ventilation, not smoking bans.

ASH: Many studies and scientific bodies have concluded that the risks from ETS remain higher — even in buildings with the best ventilating systems — than we would accept in other circumstance.

For example, air pollution levels in many public places were found to exceed federal outdoor air quality criteria, even in the "no smoking" sections. Repace & Lowrey, "Indoor Air Pollution . . .," *Science*, Vol. 208, 5/2/80.

Even separate smoking rooms don't provide acceptable levels of protection since tobacco smoke is recirculated. No filter can remove the cancer-causing gases, and most of the cancer-causing particles are too small to be trapped. Repace & Lowrey, "An Indoor Air Quality Standard . . .," *NY State J. Med.*, 85:381-83 (1985).

For additional information and arguments refuting the tobacco industry's challenges to the EPA Report, see the EPA Report; excerpts from it on pages 11-14 of this document; and Repace & Lowrey, "Issues and answers concerning passive smoking in the workplace: rebutting tobacco industry arguments," *Tobacco Control* 1992; 1:208-219.

Questions for Witnesses

To aid a legislative or administrative body in judging the independence (or bias), credibility, and expertise of witnesses who testify on issues related to the control of ETS, and to provide a full and complete record, ASH respectfully suggests that answers to the following questions be demanded.

The questions can be asked by the Chair or by any member of the body conducting the hearing. Any witness may also ask the Chair or the hearing body to ask such questions of the other witnesses.

"Do you or your organization receive or expect to receive any money from the tobacco industry, or have any other direct or indirect financial ties to it? If so, please describe in detail."

"Do you believe that scientific and medical evidence clearly establishes that tobacco smoke causes lung cancer and other fatal diseases in SMOKERS?"

"Please briefly define the following terms, all of which are fundamental to understanding and evaluating the scientific evidence: e.g., 'binomial distribution,' 'Chi-square test,' and 'two-tailed test.' [Other common phrases can easily be supplied by a local high school statistics teacher]

EPA finds ETS creates serious health risks for children

The EPA found that ETS causes in young children each year:

- 150,000-300,000 lower respiratory infections including pneumonia, bronchitis, and bronchiolitis resulting in
- 7,500-15,000 hospitalizations
- 200,000-1,000,000 asthma attacks
- 8,000-26,000 new cases of asthma
- increased middle ear effusion
- respiratory symptoms of irritation
- significantly reduced lung function

It also found that "there is strong evidence that infants whose mothers smoked are at increased risk of dying suddenly and unexpectedly during the first year of life."

Following are the abbreviated citations to the studies on which the EPA principally relied.

ETS and Asthma in Children

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The courts protect children from ETS

Even prior to the release of the EPA Report, courts in Illinois, Louisiana, Michigan, Missouri, New York, Pennsylvania, Tennessee, and Texas have all considered the harmful effects of secondhand tobacco smoke on children. With new evidence about the extent of the dangers now available in an official government report, several trends already underway are likely to accelerate.

ETS AS CUSTODY ISSUE

With the change from "fault" to "no-fault" divorce laws, judges no longer are able to simply apply mechanical rules and award custody to the party found not to be at fault.

Similarly, the movement towards sexual equality means that judges can no longer assume that a mother is always a better care provider than a father, and fathers are increasingly seeking custody.

Therefore, more judges are facing situations in which two parents, both apparently equally qualified and without any "black marks" such as problems with illegal drugs or alcohol, are each seeking custody.

In such cases, the danger of exposing the child to ETS is more likely to be a factor in making the determination.

Several courts have now ruled that it is a relevant factor which may be raised by the parties and considered.

At least one court has gone further, stating that the health risk posed by secondhand smoke in the home was a factor that "must be considered, as would alcohol consumption for example, when viewing the suitability of a household environment in which a child is to be placed." *Satalino v. Satalino*, No. 11440-86, Nassau County, NY 10/10/90.

COURT ORDERS

In addition to denying or limiting visitation rights based upon the concern about ETS, judges are also growing increasingly willing to issue court orders prohibiting exposing the child to tobacco smoke. This is true even where a statute does not authorize the

"The controversy over whether smokers damage the health of people they live with has found its way into child custody cases — and that's bad news for smokers." Marcus, "Parent's Smoking Becomes Issue in Child Custody Cases," *Wall Street Journal*, 10/18/90

"Parents who smoke in front of their children may get burned in child custody and visitation disputes." Dumas, "Smoking Could Become Custody Battle Weapon," *Lawyers Weekly*, 6/24/91

"The Trial Judge found that the failure of the mother and grandmother to discontinue smoking when recommended by the child's physician was strong evidence of a lack of proper concern for the welfare of the child. A belated cessation of smoking might evidence a desire for the custody of the child rather than concern for the welfare of the child." *Mitchell v. Mitchell*, 1991 WL 63674 (Tenn.App., 1991).

issuance of such orders. See *Roofeh v. Roofeh*, 525 N.Y.S.2d 765 (Nassau Cty, 1988).

LOSS OF CUSTODY

In extreme cases, custody may be lost over the issue of smoking. In 1989 in Denton, MD, a judge placed a three-year-old girl with severe asthma in a foster home when her parents continued to smoke around her.

In the Mitchell case noted above, custody was denied to a mother who had previously smoked in the presence of her child, even though she had subsequently stopped.

For assistance in raising these issues in legal proceedings, please have your lawyer contact ASH's attorneys.

What others are saying and doing about ETS

"EPA Report Sparks Antismoking Plans: Plaintiffs' Suits May Prod Firms To Bar Smoking — The [EPA] is counting mainly on plaintiff's lawyers, rather than regulators, to drive businesses to ban smoking on their premises, and the lawyers are eager to comply. As a result of the EPA's report linking 'passive' tobacco smoke to lung cancer and other ailments, a new wave of tobacco-related lawsuits is likely, legal specialists say. These are expected to include workers' compensation claims [and] damages suits by customers who experience adverse reactions." *Wall Street Journal* 1/7/93

"Already, 56% of organizations surveyed are completely smoke-free; by the year 2002, another 40% will have enacted a smoke-free policy. Only 4% said they expected to continue allowing smoking during the next 10 years." *International Facility Management Association*

"It's just a matter of time before smoking is completely banned in the workplace. It will happen in 10 years - maybe less." *National Alliance of Business*

"Why Our Kids Are Breathing Easier: Our Restaurant is Now a Smoke-Free Environment — Since we are a restaurant concept catering to families, we are always concerned about health risks affecting children. One of those risks is the effect of second-hand smoke. Recent health advisories have studied the effects of second-hand smoke and, because of the results, we have determined it is a risk we cannot afford to take. Therefore, our restaurant is now a smoke-free environment." *ShowBiz Pizza Time, Inc. (ChuckE Cheese)*

"Employers that continue to allow smoking in the workplace, even under the most restrictive circumstances, may be more vulnerable than ever to litigation by nonsmokers." *Employee Benefit News*, 3/93.

"More and more the owners or operators of public facilities like the Orioles are sending tobacco smoke the way of flaking asbestos — and for the same reason. It kills innocent people." *Baltimore Sun*, 1/10

"When I learned that second-hand smoke is a known carcinogen with no safe level of exposure, and that air-conditioning simply recirculates it, I decided I did not want my family, my customers or my employees to breathe tobacco smoke. Ten months ago I made all four of my restaurants no smoking. . . yet [my restaurants'] sales are about the same. I've had a few guests upset about my policy, but most of them, after hearing the reason why, decided to stay." *Pasadena [CA] Restaurant Owner*

"If indoor smoking isn't curbed, some people who think they've been put at risk by secondhand smoke may wind up taking their complaints to court." *Raleigh News & Observer*, 1/10

"An increasing number [of restaurants] are in the process of banning smoking. There is not a chain in the country that is not considering it today." *National Restaurant Association*

"McDonald's Corp., the world's largest restaurant operator, is considering banning smoking in its nearly 9,000 U.S. outlets . . . McDonald's . . . has been a kind of corporate weather vane on social policy issues." *Washington Post*, 2/19/93

"As a result of the EPA ruling, Greyhound Lines Inc. says it plans to reassess a smoking policy that had already

"The Heat is on: Anti-smokers Promise an All-Out War This Year, and They're Going After Restaurants — Even before the EPA declared secondhand smoke a Class A carcinogen — along with asbestos and benzene — the nationwide movement to ban virtually all smoking in restaurants had roared to a blaze. Three years ago, only three localities had outlawed smoking, either in restaurants or all workplaces. By [1/1/93], the total was up to 47 [including] Flagstaff, Ariz., Stockbridge, Mass., and Madison, Wisc." *Restaurant Business*, 2/10/93.

grown increasingly restrictive in recent years. 'Given the EPA findings, we will seriously consider abandoning smoking for all of our locations.'" *Wall Street Journal*, 1/7/93

"No one would grant his neighbor the right to blow tiny amounts of asbestos into a room or sprinkle traces of pesticide onto food. By the same logic, smokers have no right to spew even more noxious clouds into the air around them." *New York Times*, 1/16

"Lawmaker Would Punish Drivers Who Smoke With Kids in the Car — Anyone caught smoking in a car carrying kids under 16 . . . would be fined \$50 under legislation proposed . . . by state Rep. Peter Daley. The Washington County [PA] Democrat says the bill was spurred by a January report from the [EPA] documenting the health risks to children from secondary smoke. 'The major focus of that report was the fact that secondary tobacco smoke causes serious health problems for thousands of American children,' Daley said." *U.P.I.*, 3/3/93.



Legal liability for permitting smoking

Even without the new evidence now available in the EPA Report, workers have long been able to recover compensation for injuries caused by exposure to tobacco smoke. So far, they have been successful under a variety of legal theories and doctrines:

- **common law and negligence:** when an employer fails to provide a reasonably safe and healthful workplace, even in the absence of a statute;
- **workers' compensation:** designed to compensate workers for job-related injuries and health problems;
- **unemployment insurance:** protects workers who lose their jobs through no fault of their own;
- **disability:** to protect workers made unable to work; and even
- **discrimination:** unfair retaliation against nonsmokers

In addition, a number of rulings held that persons who are sensitive to tobacco smoke are "handicapped persons." That meant that entities covered by the law at the time — governments and large recipients of federal funds — had to make a reasonable accommodation to protect such people.

Since the new Americans With Disabilities Act (ADA) imposes the same obligations on virtually all businesses, many more legal actions under this theory are likely to be filed and to be successful. Already, ASH has filed an ADA complaint against an airport, and ADA lawsuits have been filed against McDonald's and other fast-food outlets.

The EPA Report is likely to make it much easier for employees to prove the harmful effect of ETS in all of the types of cases outlined above. It is also likely to open the door for new types of suits.

For example, a child brought into the smoking section of a fast-food restaurant or other public place could sue the owner if he or she suffered an asthmatic attack or other medical problem as a result. In such a suit, the carelessness of the adult who brought the child into the smoking section is not a valid legal

Cases of Particular Interest

Smoke drifting up from a first-floor smoking area into a second-floor classroom was enough to trigger chronic lung disease in a teacher who was awarded \$29,999.¹

A waiter who suffered a heart attack as a result of working in a smoke-filled bar received \$95,000.²

A secretary was held to be "environmentally disabled" because she could not work where she was exposed to tobacco smoke. Her employer paid her \$50,000 plus \$500/mo for the rest of her life, even though she was free to work in any other smoke-free office.³

Pointing out that smoking was banned in one room because it adversely affected a computer, a judge, even prior to evidence of long-term health hazards from ETS, ordered a smoking ban in the office of a smoke-sensitive employee.⁴

An Army employee sensitive to tobacco smoke was a "handicapped person" under the Federal Rehabilitation Act, and his employer was required to make a reasonable accommodation to his handicap.⁵

A government employee had no right to smoke, and could be fired for smoking even one cigarette on his own time off the job.⁶

1. Schiller v. Los Angeles Unified School District PAS 656, PAS 150, LA 607109, Calif. Workers' Compensation Appeals Board, 3/20/92; 2. Ushii v. State Compensation Insurance Fund, Cal. W. Fed. Restaurant (Calif. Workers' Compensation Appeals Board 1990); 3. Parodi v. Merit Systems Protection Board 690 F.3d 731 (9th Cir. 1982); 4. Shump v. New Jersey Bell Telephone Company, 368 A.2d 408 (1976); 5. Pletten v. Department of the Army, U.S. Merit Systems Protection Board No. CHD751801029, CHD1520 2901 (1983); see also Vickers v. The Veterans Administration, 548 F. Supp. 85 (1982); 6. West v. Office of Personnel Management (Merit Systems Protection Board, Dallas Regional Office, Docket No. DA 9318610314, 1986); 7. G. Grandstaff v. City of Oklahoma City, 816 F.2d 539 (10th Cir. 1987).

defense for the business.

Similar legal actions could also be brought on behalf of young children who suffered medical problems as a result of exposure in the smoking sections of airplanes on overseas flights.

Some of the legal precedents involving exposure to tobacco smoke are discussed or cited on this page.

COMMON LAW: *Heustal v. Singer* 183 Cal. Rpt. 159 (App. 1982); *Smith v. Western Electric Company* 643 S.W. 2d (Mo. App. 1983).

NEGLIGENCE: *McCarthy v. Department of Social Health Services*, 110 Wash. 2d, 812, 759 P.2d 551 (1988).

WORKMEN'S COMPENSATION: *Brooks v. Trans World Airlines et al. California Workers' Compensation Appeals Board*, Case No. 76-57 257-975 (1977); *Schiller v. Mountain Bell Telephone N.M. App.* 630 P.2d 1231 (1981); *Ratchel v. Fresno County (California)* (1987); *In the Matter of the Compensation of Marlene W. Rutter, Oregon Workers' Compensation Board*, WCB Case No. 14-07248, Claim No. D69050, WCD No. None-S.S.N. 343-46-9617 (1985); *In the Matter of the Compensation of Mary A. Downey, Oregon Workers' Compensation Board WCB Case No. 14-01911, Claim No. D605190, DOI 10-13-82, WCD File No. C151790, SSN 543-34-0881* (1985); *J and R Elec. No. 0853 282 (N.Y. Workers' Comp. Bd. Dec. 1988) (WESTLAW, MWC, ADMED-Judges, 1988 WL 319700); *Johannsen v. New York City Department of Housing Preservation and Development* 154 A.2d 753, 546 N.Y.S. 2d 40 (1989); *Kufahl v. Wisconsin Bell, Inc. (Wisconsin Labor and Industrial Review Commission, Claim No. 88-000676, 1990) *Bea v. Massachusetts Turnpike Authority* (Report of Administrative Judge of the Department of Industrial Accident (Dianne Solomon) Board No. 03921088, October 21, 1991); *Sewers v. The Child Center (Workers' Compensation Board of Indiana Application Number 112490, January 6, 1992)***

UNEMPLOYMENT INSURANCE: *Hochman, N.Y.S. Department of Labor, F.A. Russo Incorp. S.S.A. #100-12-1465, Appeal #233,526, Referee 76-329-83* (1976); *Meyer v. C.P. Clare and Company et al.*, Industrial Commission of Idaho DOE 615-78 (1978); *Alexander v. Unemployment Ins. Appeals Bd.* 104 Cal. App. 3d 97, Cal. Rpt. 411 (1980); *Finis and Storchmann Bros., Pennsylvania Unemployment Compensation Board of Review, Appeal No. 8-43-R-824, Decision No. 8-218501* (1983); *McCorkle v. Employment Development Department et al.* 156 Cal. App. 3d 1067, 203 Cal. Rpt. 156 (Cal. App. 2 Dist. Div. 6, 1984); *Lapham v. Commonwealth Unemployment Compensation Board*, 519 A.2d 1501 (Pa. Cmwlth. 1987).

DISCRIMINATION AGAINST NONSMOKERS: *Tari Wav v. Area Agency on Aging Initial Determination, EOC Case #2393, Equal Opportunity Comm., City of Madison, Wisconsin* (1977); *Department of Fair Employment and Housing v. Fresno County, California Fair Employment and Housing Commission Case No. FEPR1-82-CR000ph* (1984); *Department of Fair Employment and Housing v. County of Fresno Department of Social Services Case No. FEPR1-82-CR000ph, FEPR1-83-CR001ph, N21141 FEPR1-83-CR000ph, FEPR1-83-CR001ph N21162* (1985); *County of Fresno v. Fair Employment and Housing Commission of the State of California, *Brooks and Capo, Real Parties in Interest, et al. v. App. State of California, Fifth App. Dist.* 266 Cal. App. 3d 1541, 277 Cal. Rpt. 555, January 23, 1991.*

FEDERAL REHABILITATION ACT CASES (DISABILITY AND HANDICAP): *Flanken v. Office of Personnel Management, U.S. Merit Systems Protection Board, Dallas Field Office No. DA93111001* (1990); *White v. United States Postal Service (Equal Employment Opportunity Commission, Appeal No. 01853426, 1987).*



EPA Report's "Summary and Conclusions" reprinted

To make its principal conclusions quickly and widely available to scientists, legislators, regulators, judges, and others who may need the official text, ASH reprints here the full and complete text of Chapter I. SUMMARY AND CONCLUSIONS of the EPA's report entitled *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*, EPA/600/6-90/006F. The report is dated "December 1992" and was publicly released on January 7, 1993. To receive a free copy of the entire report, write EPA, 26 West Martin Luther King Drive, Cincinnati, Ohio 45268, call (513) 569-7562, or Fax (513) 569-7566.

1. SUMMARY AND CONCLUSIONS

1.1. MAJOR CONCLUSIONS

Based on the weight of the available scientific evidence, the U.S. Environmental Protection Agency (EPA) has concluded that the widespread exposure to environmental tobacco smoke (ETS) in the United States presents a serious and substantial public health impact.

IN ADULTS:

- ETS is a human lung carcinogen, responsible for approximately 3,000 lung cancer deaths annually in U.S. nonsmokers.

IN CHILDREN:

- ETS exposure is causally associated with an increased risk of lower respiratory tract infections (LRTIs) such as bronchitis and pneumonia. This report estimates that 150,000 to 300,000 cases annually in infants and young children up to 18 months of age are attributable to ETS.
- ETS exposure is causally associated with increased prevalence of fluid in the middle ear, symptoms of upper respiratory tract irritation, and a small but significant reduction in lung function.
- ETS exposure is causally associated with additional episodes and increased severity of symptoms in children with asthma. This report estimates that 200,000 to 1,000,000 asthmatic children have their condition worsened by exposure to ETS.
- ETS exposure is a risk factor for new cases of asthma in children who have not previously displayed symptoms.

1.2. BACKGROUND

Tobacco smoking has long been recognized (e.g., U.S. Department of Health, Education, and Welfare [U.S. DHEW], 1964) as a major cause of mortality and morbidity, responsible for an estimated 434,000 deaths per year in the United States (Centers for Disease Control [CDC], 1991a). Tobacco use is known to cause cancer at various sites, in particular the lung (U.S. Department of Health and Human Services [U.S.

DHHS], 1982; International Agency for Research on Cancer [IARC], 1986). Smoking can also cause respiratory diseases (U.S. DHHS, 1984, 1989) and is a major risk factor for heart disease (U.S. DHHS, 1983). In recent years, there has been concern that nonsmokers may also be at risk for some of these health effects as a result of their exposure ("passive smoking") to the tobacco smoke that occurs in various environments occupied by smokers. Although this ETS is dilute compared with the mainstream smoke (MS) inhaled by active smokers, it is chemically similar, containing many of the same carcinogenic and toxic agents.

In 1986, the National Research Council (NRC) and the Surgeon General of the U.S. Public Health Service independently assessed the health effects of exposure to ETS (NRC, 1986; U.S. DHHS, 1986). Both of the 1986 reports conclude that ETS can cause lung cancer in adult nonsmokers and that children of parents who smoke have increased frequency of respiratory symptoms and acute lower respiratory tract infections, as well as evidence of reduced lung function.

More recent epidemiologic studies of the potential associations between ETS and lung cancer in nonsmoking adults and between ETS and noncancer respiratory effects more than double the size of the database available for analysis from that of the 1986 reports. This EPA report critically reviews the current database on the respiratory health effects of passive smoking; these data are utilized to develop a hazard identification for ETS and to make quantitative estimates of the public health impacts of ETS for lung cancer and various other respiratory diseases.

The weight-of-evidence analysis for the lung cancer hazard identification is developed in accordance with U.S. EPA's *Guidelines for Carcinogen Risk Assessment* (U.S. EPA, 1986a) and established principles for evaluating epidemiologic studies. The analysis considers animal bioassays and genotoxicity studies, as well as biological measurements of human uptake of tobacco smoke components and epidemiologic data on active and passive smoking. The availability of abundant and consistent human data, especially human data at actual environmental levels of exposure to the specific agent (mixture) of concern, allows a hazard identification to be made with a high degree of certainty. The conclusive evidence of the dose-related lung carcinogenicity of MS in active

smokers (Chapter 4), coupled with information on the chemical similarities of MS and ETS and evidence of ETS uptake in nonsmokers (Chapter 3), is sufficient by itself to establish ETS as a known human lung carcinogen, or "Group A" carcinogen under U.S. EPA's carcinogen classification system. In addition, this document concludes that the overall results of 30 epidemiologic studies on lung cancer and passive smoking (Chapter 5), using spousal smoking as a surrogate of ETS exposure for female never-smokers, similarly justify a Group A classification.

The weight-of-evidence analyses for the noncancer respiratory effects are based primarily on a review of epidemiologic studies (Chapter 7). Most of the endpoints examined are respiratory disorders in children, where parental smoking is used as a surrogate of ETS exposure. For the noncancer respiratory effects in nonsmoking adults, most studies used spousal smoking as an exposure surrogate. A causal association was concluded to exist for a number of respiratory disorders where there was sufficient consistent evidence for a biologically plausible association with ETS that could not be explained by bias, confounding, or chance. The fact that the database consists of human evidence from actual environmental exposure levels gives a high degree of confidence in this conclusion. Where there was suggestive but inconclusive evidence of causality, as was the case for asthma induction in children, ETS was concluded to be a risk factor for that endpoint. Where data were inconsistent or inadequate for evaluation of an association, as for acute upper respiratory tract infections and acute middle ear infections in children, no conclusions were drawn.

This report also has attempted to provide estimates of the extent of the public health impact, where appropriate, in terms of numbers of ETS-attributable cases in nonsmoking subpopulations. Unlike for qualitative hazard identification assessments, where information from many sources adds to the confidence in a weight-of-evidence conclusion, for quantitative risk assessments, the usefulness of studies usually depends on how closely the study population resembles nonsmoking segments of the general population. For lung cancer estimates among U.S. nonsmokers, the substantial epidemiologic database of ETS and lung cancer among U.S. female never-smokers was considered to provide the most appropriate



information. From these U.S. epidemiology studies, a pooled relative risk estimate was calculated and used in the derivation of the population risk estimates. The large number of studies available, the generally consistent results, and the condition of actual environmental levels of exposure increase the confidence in these estimates. Even under these circumstances, however, uncertainties remain, such as in the use of questionnaires and current biomarker measurements to estimate past exposure, assumptions of exposure-response linearity, and extrapolation to male never-smokers and to ex-smokers. Still, given the strength of the evidence for the lung carcinogenicity of tobacco smoke and the extensive human database from actual environmental exposure levels, fewer assumptions are necessary than is usual in EPA quantitative risk assessments, and confidence in these estimates is rated medium to high.

Population estimates of ETS health impacts are also made for certain noncancer respiratory endpoints in children, specifically lower respiratory tract infections (i.e., pneumonia, bronchitis, and bronchiolitis) and episodes and severity of attacks of asthma. Estimates of ETS-attributable cases of LRI in infants and young children are thought to have a high degree of confidence because of the consistent study findings and the appropriateness of parental smoking as a surrogate measure of exposure in very young children. Estimates of the number of asthmatic children whose condition is aggravated by exposure to ETS are less certain than those for LRIs because of different measures of outcome in various studies and because of increased extraparental exposure to ETS in older children. Estimates of the number of new cases of asthma in previously asymptomatic children also have less confidence because at this time the weight of evidence for asthma induction, while suggestive of a causal association, is not conclusive.

Most of the ETS population impact estimates are presented in terms of ranges, which are thought to reflect reasonable assumptions about the estimates of parameters and variables required for the extrapolation models. The validity of the ranges is also dependent on the appropriateness of the extrapolation models themselves.

While this report focuses only on the respiratory health effects of passive smoking, there also may be other health effects of concern. Recent analyses of more than a dozen epidemiology and toxicology studies (e.g., Steenland, 1992; National Institute for Occupational Safety and Health [NIOSH], 1991) suggest that ETS exposure may be a risk factor for cardiovascular disease. In addition, a few studies in the literature link ETS exposure to cancers of other sites; at this time, that database appears inadequate for any conclusion. This report does not develop an analysis of either the nonrespiratory cancer or the heart disease data and takes no position on whether ETS is a risk factor for these diseases. If it is, the total public health impact from ETS will be greater than that discussed here.

1.3. PRIMARY FINDINGS

A. Lung Cancer in Nonsmoking Adults

1. Passive smoking is causally associated with lung cancer in adults, and ETS, by the total weight of evidence, belongs in the category of compounds classified by EPA as Group A (known human) carcinogens.

2. Approximately 3,000 lung cancer deaths per year among nonsmokers (never-smokers and former smokers) of both sexes are estimated to be attributable to ETS in the United States. While there are statistical and modeling uncertainties in this estimate, and the true number may be higher or lower, the assumptions used in this analysis would tend to underestimate the actual population risk. The overall confidence in this estimate is medium to high.

B. Noncancer Respiratory Diseases and Disorders

1. Exposure of children to ETS from parental smoking is causally associated with:

a. increased prevalence of respiratory symptoms of irritation (cough, sputum, and wheeze),

b. increased prevalence of middle ear effusion (a sign of middle ear disease), and

c. a small but statistically significant reduction in lung function as tested by objective measures of lung capacity.

2. ETS exposure of young children and particularly infants from parental (and especially mother's) smoking is causally associated with an increased risk of LRIs (pneumonia, bronchitis, and bronchiolitis). This report estimates that exposure to ETS contributes 150,000 to 300,000 LRIs annually in infants and children less than 18 months of age, resulting in 7,500 to 15,000 hospitalizations. The confidence in the estimates of LRIs is high. Increased risks for LRIs continue, but are lower in magnitude, for children until about age 3; however, no estimates are derived for children over 18 months.

3. a. Exposure to ETS is causally associated with additional episodes and increased severity of asthma in children who already have the disease. This report estimates that ETS exposure exacerbates symptoms in approximately 20% of this country's 2 million to 5 million asthmatic children and is a major aggravating factor in approximately 10%.

b. In addition, the epidemiologic evidence is suggestive but not conclusive that ETS exposure increases the number of new cases of asthma in children who have not previously exhibited symptoms. Based on this evidence and the known ETS effects on both the immune system and lungs (e.g., atopy and airway hyperresponsiveness), this report concludes that ETS is a risk factor for the induction of asthma in previously asymptomatic children. Data suggest that relatively high levels of exposure are required to induce new cases of asthma in children. This report calculates that previously asymptomatic children exposed to ETS from mothers who smoke at least 10 cigarettes per day will exhibit an estimated 8,000 to 26,000 new cases of asthma annually. The confidence in

this range is medium and is dependent on the conclusion that ETS is a risk factor for asthma induction.

4. Passive smoking has subtle but significant effects on the respiratory health of nonsmoking adults, including coughing, phlegm production, chest discomfort, and reduced lung function.

This report also has reviewed data on the relationship of maternal smoking and sudden infant death syndrome (SIDS), which is thought to involve some unknown respiratory pathogenesis. The report concludes that while there is strong evidence that infants whose mothers smoke are at an increased risk of dying from SIDS, available studies do not allow us to differentiate whether and to what extent this increase is related to in utero versus postnatal exposure to tobacco smoke products. Consequently, this report is unable to assert whether or not ETS exposure by itself is a risk factor for SIDS independent of smoking during pregnancy. Regarding an association of parental smoking with either upper respiratory tract infections (colds and sore throats) or acute middle ear infections in children, this report finds the evidence inconclusive.

1.3.1. ETS and Lung Cancer

1.3.1.1. Hazard Identification

The Surgeon General (U.S. DHHS, 1989) estimated that smoking was responsible for more than one of every six deaths in the United States and that it accounted for about 90% of the lung cancer deaths in males and about 80% in females in 1985. Smokers, however, are not the only ones exposed to tobacco smoke. The sidestream smoke (SS) emitted from a smoldering cigarette between puffs (the main component of ETS) has been documented to contain virtually all of the same carcinogenic compounds (known and suspected human and animal carcinogens) that have been identified in the mainstream smoke (MS) inhaled by smokers (Chapter 3). Exposure concentrations of these carcinogens to passive smokers are variable but much lower than for active smokers. An excess cancer risk from passive smoking, however, is biologically plausible.

Based on the firmly established causal association of lung cancer with active smoking with a dose-response relationship down to low doses (Chapter 4), passive smoking is considered likely to affect the lung similarly. The widespread presence of ETS in both home and workplace and its absorption by nonsmokers in the general population have been well documented by air sampling and by body measurement of biomarkers such as nicotine and cotinine (Chapter 3). This raises the question of whether any direct evidence exists for the relationship between ETS exposure and lung cancer in the general population and what its implications may be for public health. This report addresses that question by reviewing and analyzing the evidence from 30 epidemiologic studies of effects from normally occurring environmental levels of ETS (Chapter 5). Because there is widespread exposure and it is difficult to construct a truly unexposed subgroup

of the general population, these studies attempt to compare individuals with higher ETS exposure to those with lower exposures. Typically, female never-smokers who are married to a smoker are compared with female never-smokers who are married to a nonsmoker. Some studies also consider ETS exposure of other subjects (i.e., male never-smokers and long-term former smokers of either sex) and from other sources (e.g., workplace and home exposure during childhood), but these studies are fewer and represent fewer cases, and they are generally excluded from the analysis presented here. Use of the female never-smoker studies provides the largest, most homogeneous database for analysis to determine whether an ETS effect on lung cancer is present. This report assumes that the results for female never-smokers are generalizable to all nonsmokers.

Given that ETS exposures are at actual environmental levels and that the comparison groups are both exposed to appreciable background (i.e., nonspousal) ETS, any excess risk for lung cancer from exposure to spousal smoke would be expected to be small. Furthermore, the risk of lung cancer is relatively low in nonsmokers, and most studies have a small sample size, resulting in a very low statistical power (probability of detecting a real effect if it exists). Besides small sample size and low incremental exposures, other problems inherent in several of the studies may also limit their ability to detect a possible effect. Therefore, this report examines the data in several different ways. After downward adjustment of the relative risks for smoker misclassification bias, the studies are individually assessed for strength of association, both for the overall data and for the highest exposure group when exposure-response data are available, and for exposure-response trend. Then the study results are pooled by country using statistical techniques for combining data, including both positive and nonpositive results, to increase the ability to determine whether or not there is an association between ETS and lung cancer. Finally, in addition to the previous statistical analyses that weight the studies only by size, regardless of design and conduct, the studies are qualitatively evaluated for potential confounding, bias, and likely utility to provide information about any lung carcinogenicity of ETS. Based on these qualitative considerations, the studies are categorized into one of four tiers and then statistically analyzed successively by tier.

Results from all of the analyses described above strongly support a causal association between lung cancer ETS exposure. The overall proportion (9/30) of individual studies found to show an association between lung cancer and spousal ETS exposure at all levels combined is unlikely to occur by chance ($p < 10^{-7}$). When the analysis focuses on higher levels of spousal exposure, every one of the 17 studies with exposure-level data shows increased risk in the highest exposure group; 9 of these are significant at the $p < 0.05$ level, despite most having low power, another result highly unlikely to occur by chance ($p < 10^{-7}$). Similarly, the proportion (10/14; $p <$

10⁻⁷) showing a statistically significant exposure-response trend is highly supportive of a causal association.

Combined results by country showed statistically significant associations for Greece (2 studies), Hong Kong (4 studies), Japan (5 studies), and the United States (11 studies), and in that order of strength of relative risk. Pooled results of the four Western European studies (three countries) actually showed a slightly stronger association than that of the United States, but it was not statistically significant, probably due to the smaller sample size. The combined results of the Chinese studies do not show an association between ETS and lung cancer; however, two of the four Chinese studies were designed mainly to determine the lung cancer effects of high levels of other indoor air pollutants indigenous to those areas, which would obscure a smaller ETS effect. These two Chinese studies do, however, provide very strong evidence on the lung carcinogenicity of these other indoor air pollutants, which contain many of the same components as ETS. When results are combined only for the other two Chinese studies, they demonstrate a statistically significant association for ETS and lung cancer.

The heterogeneity of observed relative risk estimates among countries could result from several factors. For example, the observed differences may reflect true differences in lung cancer rates for never-smokers, in ETS exposure levels from nonspousal sources, or in related lifestyle characteristics in different countries. For the time period in which ETS exposure was of interest for these studies, spousal smoking is considered to be a better surrogate for ETS exposure in more "traditional" societies, such as Japan and Greece, than in the United States. In the United States, other sources of ETS exposure (e.g., work and public places) are generally higher, which obscures the effects of spousal smoking and may explain the lower relative risks observed in the United States. Nevertheless, despite observed differences between countries, all showed evidence of increased risk.

Based on these analyses and following the U.S. EPA's *Guidelines for Carcinogen Risk Assessment* (U.S. EPA, 1986a), EPA concludes that environmental tobacco smoke is a Group A (known human) carcinogen. This conclusion is based on a total weight of evidence, principally:

- **Biological plausibility.** ETS is taken up by the lungs, and components are distributed throughout the body. The presence of the same carcinogens in ETS and MS, along with the established causal relationship between lung cancer and active smoking with the dose-response relationships exhibited down to low doses, establishes the plausibility that ETS is also a lung carcinogen.
- **Supporting evidence from animal bioassays and genotoxicity experiments.** The carcinogenicity of tobacco smoke has been demonstrated in lifetime inhalation studies in the hamster, intrapulmonary implantations in the rat, and skin painting in the mouse. There are no lifetime animal inhalation studies of ETS; however, the carcinogenicity of SS condensates has been shown in intrapulmonary implantations and skin painting experiments. Positive results of genotoxicity testing for both MS and ETS provide corroborative evidence for their carcinogenic potential.

• **Consistency of response.** All 4 of the cohort studies and 20 of the 26 case-control studies observed a higher risk of lung cancer among the female never-smokers classified as ever exposed to any level of spousal ETS. Furthermore, every one of the 17 studies with response categorized by exposure level demonstrated increased risk for the highest exposure group. When assessment was restricted to the 19 studies judged to be of higher utility based on study design, execution, and analysis (Appendix A), 17 observed higher risks, and 6 of these increases were statistically significant, despite most having low statistical power. Evaluation of the total study evidence from several perspectives leads to the conclusion that the observed association between ETS exposure and increased lung cancer occurrence is not attributable to chance.

• **Broad-based evidence.** These 30 studies provide data from 8 different countries, employ a wide variety of study designs and protocols, and are conducted by many different research teams. Results from all countries, with the possible exception of two areas of China where high levels of other indoor air lung carcinogens were present, show small to modest increases in lung cancer associated with spousal ETS exposure. No alternative explanatory variables for the observed association between ETS and lung cancer have been indicated that would be broadly applicable across studies.

• **Upward trend in exposure-response.** Both the largest of the cohort studies—the Japanese study of Hirayama with 200 lung cancer cases—and the largest of the case-control studies—the U.S. study by Fontham and associates (1991) with 420 lung cancer cases and two sets of controls—demonstrate a strong exposure-related statistical association between passive smoking and lung cancer. This upward trend is well supported by the preponderance of epidemiology studies. Of the 14 studies that provide sufficient data for a trend test by exposure level, 10 were statistically significant despite most having low statistical power.

• **Detectable association at environmental exposure levels.** Within the population of married women who are lifelong nonsmokers, the excess lung cancer risk from exposure to their smoking husbands' ETS is large enough to be observed, even for all levels of their spousal exposure combined. Carcinogenic responses are usually detectable only in high-exposure circumstances, such as occupational settings, or in experimental animals receiving very high doses. In addition, effects are harder to observe when there is substantial background exposure in the comparison groups, as is the case here.

• **Effects remain after adjustment for potential upward bias.** Current and ex-smokers may be misreported as never-smokers, thus inflating the apparent cancer risk for ETS exposure. The



evidence remains statistically significant and conclusive, however, after adjustments for smoker misclassification. For the United States, the summary estimate of relative risk from nine case-control plus two cohort studies is 1.19 (90% confidence interval [C.I.] = 1.04, 1.35; $p < 0.05$) after adjustment for smoker misclassification. For Greece, 2.00 (1.42, 2.83), Hong Kong, 1.61 (1.25, 2.06), and Japan, 1.44 (1.13, 1.85), the estimated relative risks are higher than those of the United States and more highly significant after adjusting for the potential bias.

- **Strong associations for highest exposure groups.** Examining the groups with the highest exposure levels increases the ability to detect an effect, if it exists. Nine of the sixteen studies worldwide for which there are sufficient exposure-level data are statistically significant for the highest exposure group, despite most having low statistical power. The overall pooled estimate of 1.81 for the highest exposure groups is highly statistically significant (90% C.I. = 1.60, 2.05; $p < 0.05$). For the United States, the overall pooled estimate of 1.38 (seven studies, corrected for smoker misclassification bias) is also highly statistically significant (90% C.I. = 1.13, 1.70; $p < 0.005$).

- **Confounding cannot explain the association.** The broad-based evidence for an association found by independent investigators across several countries, as well as the positive exposure-response trends observed in most of the studies that analyzed for them, make any single confounder highly unlikely as an explanation for the results. In addition, this report examined potential confounding factors (history of lung disease, home heat sources, diet, occupation) and concluded that none of these factors could account for the observed association between lung cancer and ETS.

1.3.1.2. Estimation of Population Risk

The individual risk of lung cancer from exposure to ETS does not have to be very large to translate into a significant health hazard to the U.S. population because of the large number of smokers and the widespread presence of ETS. Current smokers comprise approximately 26% of the U.S. adult population and consume more than one-half trillion cigarettes annually (1.5 packs per day, on average), causing nearly universal exposure to at least some ETS. As a biomarker of tobacco smoke uptake, cotinine, a metabolite of the tobacco-specific compound nicotine, is detectable in the blood, saliva, and urine of persons recently exposed to tobacco smoke. Cotinine has typically been detected in 50% to 75% of reported nonsmokers tested (50% equates to 63 million U.S. nonsmokers age 18 or older).

The best estimate of approximately 3,000 lung cancer deaths per year in U.S. nonsmokers age 35 and over attributable to ETS (Chapter 6) is based on data pooled from all 11 U.S. epidemiologic studies of never-smoking women married to smoking spouses. Use of U.S. studies should increase the confidence in these estimates. Some mathematical modeling is required to adjust for

expected bias from misclassification of smoking status and to account for ETS exposure from sources other than spousal smoking. The overall relative risk estimate of 1.19 for the

United States, already adjusted for smoker misclassification bias, becomes 1.59 after adjusting for background ETS sources (1.34 for nonspousal exposures only). Assumptions are also needed to relate responses in female never-smokers to those in male never-smokers and ex-smokers of both sexes, and to estimate the proportion of the nonsmoking population exposed to various levels of ETS. Overall, however, the assumptions necessary for estimating risk add far less uncertainty than other EPA quantitative assessments. This is because the extrapolation for ETS is based on a large database of human studies, all at levels actually expected to be encountered by much of the U.S. population.

The components of the 3,000 lung cancer deaths figure include approximately 1,500 female never-smokers, 500 male never-smokers, and 1,000 former smokers of both sexes. More females are estimated to be affected because there are more female than male nonsmokers. These component estimates have varying degrees of confidence; the estimate of 1,500 deaths for female never-smokers has the highest confidence because of the extensive database. The estimate of 500 for male never-smokers is less certain because it is based on the female never-smoker response and is thought to be low because males are generally subject to higher background ETS exposures than females. Adjustment for this higher background exposure would lead to higher risk estimates. The estimate of 1,000 lung cancer deaths for former smokers of both sexes is considered to have the lowest confidence, and the assumptions used are thought to make this estimate low as well.

Workplace ETS levels are generally comparable with home ETS levels, and studies using body cotinine measures as biomarkers demonstrate that nonspousal exposures to ETS are often greater than exposure from spousal smoking. Thus, this report presents an alternative breakdown of the estimated 3,000 ETS-attributable lung cancer deaths between spousal and nonspousal exposures. By extension of the results from spousal smoking studies, coupled with biological measurements of exposure, more lung cancer deaths are estimated to be attributable to ETS from combined nonspousal exposures—2,200 of both sexes—than from spousal exposure—800 of both sexes. This spouse-versus-other-sources partitioning depends on current exposure estimates that may or may not be applicable to the exposure period of interest. Thus, this breakdown contains this element of uncertainty in addition to those discussed above with respect to the previous breakdown.

An alternative analysis, based on the large Fontnam et al. (1991) study, which is the only study that provides biomarker estimates of both relative risk and ETS exposure, yields population risk point estimates of 2,700 and 3,600. These population risk estimates are highly consistent with the estimate of 3,000 based on the combined

U.S. studies.

While there is statistical variance around all of the parameters used in the quantitative assessment, the two largest areas of uncertainty are probably associated with the relative risk estimate for spousal ETS exposure and the parameter estimate for the background ETS exposure adjustment. A sensitivity analysis that independently varies these two estimates yields population risk estimates as low as 400 and as high as 7,000. These extremes, however, are considered unlikely; the more probable range is narrower, and the generally conservative assumptions employed suggest that the actual population risk number may be greater than 3,000. Overall, considering the multitude, consistency, and quality of all these studies, the weight-of-evidence conclusion that ETS is a known human lung carcinogen, and the limited amount of extrapolation necessary, the confidence in the estimate of approximately 3,000 lung cancer deaths is medium to high.

1.3.2. ETS and Nonsmoker Respiratory Disorders

Exposure to ETS from parental smoking has been previously linked with increased respiratory disorders in children, particularly in infants. Several studies have confirmed the exposure and uptake of ETS in children by assaying saliva, serum, or urine for cotinine. These cotinine concentrations were highly correlated with smoking (especially by the mother) in the child's presence. Nine to twelve million American children under 5 years of age, or one-half to two-thirds of all children in this age group, may be exposed to cigarette smoke in the home (American Academy of Pediatrics, 1986; Overpeck and Moss, 1991).

With regard to the nonsmoker respiratory effects of passive smoking, this report focuses on epidemiologic evidence appearing since the two major reports of 1986 (NRC and U.S. DHHS) that bears on the potential association of parental smoking with detrimental respiratory effects in their children. These effects include symptoms of respiratory irritation (cough, sputum production, or wheeze); acute diseases of the lower respiratory tract (pneumonia, bronchitis, and bronchiolitis); acute middle ear infections and indications of chronic middle ear infections (predominantly middle ear effusion); reduced lung function (from forced expiratory volume and flow-rate measurements); incidence and prevalence of asthma and exacerbation of symptoms in asthmatics; and acute upper respiratory tract infections (colds and sore throats). The more than 50 recently published studies reviewed here essentially corroborate the previous conclusions of the 1986 reports of the NRC and Surgeon General regarding respiratory symptoms, respiratory illnesses, and pulmonary function, and they strengthen support for those conclusions by the additional weight of evidence (Chapter 7). For example, new data on middle ear effusion strengthen previous evidence to warrant the stronger conclusion in this report of a causal association with parental smoking.

Furthermore, recent studies establish associations between parental smoking and increased incidence of childhood asthma. Additional research also supports the hypotheses that in utero exposure to mother's smoke and postnatal exposure to ETS alter lung function and structure, increase bronchial responsiveness, and enhance the process of allergic sensitization, changes that are known to predispose children to early respiratory illness. Early respiratory illness can lead to long-term pulmonary effects (reduced lung function and increased risk of chronic obstructive lung disease).

This report also summarizes the evidence for an association between parental smoking and SIDS, which was not addressed in the 1986 reports of the NRC or Surgeon General. SIDS is the most common cause of death in infants ages 1 month to 1 year. The cause (or causes) of SIDS is unknown; however, it is widely believed that some form of respiratory pathogenesis is generally involved. The current evidence strongly suggests that infants whose mothers smoke are at an increased risk of dying of SIDS, independent of other known risk factors for SIDS, including low birthweight and low gestational age, which are specifically associated with active smoking during pregnancy. However, available studies do not allow this report to conclude whether that increased risk is related to in utero versus postnatal exposure to tobacco smoke products, or to both.

The 1986 reports of the NRC and Surgeon General conclude that both the prevalence of respiratory symptoms of irritation and the incidence of lower respiratory tract infections are higher in children of smoking parents. In the 18 studies of respiratory symptoms subsequent to the 2 reports, increased symptoms (cough, phlegm production, and wheezing) were observed in a range of ages from birth to toddlers, particularly in infants and preschool children. In addition to the studies on symptoms of respiratory irritation, 10 new studies have addressed the topic of parental smoking and acute lower respiratory tract illness in children, and 9 have reported statistically significant associations. The cumulative evidence is conclusive that parental smoking, especially the mother's, causes an increased incidence of respiratory illnesses from birth up to the first 18 months to 3 years of life, particularly for bronchitis, bronchiolitis, and pneumonia. Overall, the evidence confirms and strengthens the previous conclusions of the NRC and Surgeon General.

Recent studies also solidify the evidence for the conclusion of a causal association between parental smoking and increased middle ear effusion in young children. Middle ear effusion is the most common reason for hospitalization of young children for an operation.

At the time of the Surgeon General's report on passive smoking (U.S. DHHS, 1986), data were sufficient to conclude only that maternal smoking may influence the severity of asthma in children. The recent studies reviewed here strengthen and confirm these exacerbation effects. The new evidence is also conclusive that ETS exposure increases the number of episodes of asthma in

children who already have the disease. In addition, the evidence is suggestive that ETS exposure increases the number of new cases of asthma in children who have not previously exhibited symptoms, although the results are statistically significant only with children whose mothers smoke 10 or more cigarettes per day. While the evidence for new cases of asthma itself is not conclusive of a causal association, the consistently strong association of ETS both with increased frequency and severity of the asthmatic symptoms and with the established ETS effects on the immune system and airway hyperresponsiveness lead to the conclusion that ETS is a risk factor for induction of asthma in previously asymptomatic children.

Regarding the effects of passive smoking on lung function in children, the 1986 NRC and Surgeon General reports both conclude that children of parents who smoke have small decreases in tests of pulmonary output function of both the larger and smaller air passages when compared with the children of nonsmokers. As noted in the NRC report, if ETS exposure is the cause of the observed decrease in lung function, the effect could be due to the direct action of agents in ETS or an indirect consequence of increased occurrence of acute respiratory illness related to ETS.

Results from eight studies on ETS and lung function in children that have appeared since those reports add some additional confirmatory evidence suggesting a causal rather than an indirect relationship. For the population as a whole, the reductions are small relative to the interindividual variability of each lung function parameter. However, groups of particularly susceptible or heavily exposed children have shown larger decrements. The studies reviewed suggest that a continuum of exposures to tobacco products starting in fetal life may contribute to the decrements in lung function found in older children. Exposure to tobacco smoke products inhaled by the mother during pregnancy may contribute significantly to these changes, but there is strong evidence indicating that postnatal exposure to ETS is an important part of the causal pathway.

With respect to lung function effects in adults exposed to ETS, the 1986 NRC and Surgeon General reports found the data at that time inconclusive, due to high interindividual variability and the existence of a large number of other risk factors, but compatible with subtle deficits in lung function. Recent studies confirm the association of passive smoking with small reductions in lung function. Furthermore, new evidence also has emerged suggesting a subtle association between exposure to ETS and increased respiratory symptoms in adults.

Some evidence suggests that the incidence of acute upper respiratory tract illnesses and acute middle ear infections may be more common in children exposed to ETS. However, several studies failed to find any effect. In addition, the possible role of confounding factors, the lack of studies showing clear dose-response relationships, and the absence of a plausible biological mechanism preclude more definitive conclusions.

In reviewing the available evidence indicating an association (or lack thereof) between ETS exposure and the different noncancer respiratory disorders analyzed in this report, the possible role of several potential confounding factors was considered. These include other indoor air pollutants; socioeconomic status; effect of parental symptoms; and characteristics of the exposed child, such as low birthweight or active smoking. No single or combined confounding factors can explain the observed respiratory effects of passive smoking in children.

For diseases for which ETS has been either causally associated (LRIs) or indicated as a risk factor (asthma cases in previously asymptomatic children), estimates of population-attributable risk can be calculated. A population risk assessment (Chapter 8) provides a probable range of estimates that 8,000 to 26,000 cases of childhood asthma per year are attributable to ETS exposure from mothers who smoke 10 or more cigarettes per day. The confidence in this range of estimates is medium and is dependent on the suggestive evidence of the database. While the data show an effect only for children of these heavily smoking mothers, additional cases due to lesser ETS exposure also are a possibility. If the effect of this lesser exposure is considered, the range of estimates of new cases presented above increases to 13,000 to 60,000. Furthermore, this report estimates that the additional public health impact of ETS on asthmatic children includes more than 200,000 children whose symptoms are significantly aggravated and as many as 1,000,000 children who are affected to some degree.

This report estimates that ETS exposure contributes 150,000 to 300,000 cases annually of lower respiratory tract illness in infants and children younger than 18 months of age and that 7,500 to 15,000 of these will require hospitalization. The strong evidence linking ETS exposure to increased incidence of bronchitis, bronchiolitis, and pneumonia in young children gives these estimates a high degree of confidence. There is also evidence suggesting a smaller ETS effect on children between the ages of 18 months and 3 years, but no additional estimates have been computed for this age group. Whether or not these illnesses result in death has not been addressed here.

In the United States, more than 5,000 infants die of SIDS annually. It is the major cause of death in infants between the ages of 1 month and 1 year, and the linkage with maternal smoking is well established. The Surgeon General and the World Health Organization estimate that more than 700 U.S. infant deaths per year from SIDS are attributable to maternal smoking (CDC, 1991a, 1992b). However, this report concludes that at present there is not enough direct evidence supporting the contribution of ETS exposure to declare it a risk factor or to estimate its population impact on SIDS. [ASH claims no copyright to any part of this government document. It may be freely copied or reproduced by anyone.]



What you can do about ETS

This document is designed to serve as a tool and powerful weapon in the hands of every person concerned about the enormous health hazards of being exposed to ETS.

It is particularly intended for those who:

- have a condition — including any factor placing them at increased risk for heart attacks — which makes them especially sensitive to ETS
- have a child or grandchild with asthma or some other condition making them especially sensitive to ETS
- are regularly exposed to ETS on the job or other public place

ASH attorneys suggest that you use this summary of the facts about ETS to: educate, persuade, legislate, regulate, and adjudicate.

EDUCATE

Use this document to gain support for smoking restrictions by educating your nonsmoking friends, work mates, etc. about the dangers of ETS to themselves.

It can also be used to help persuade skeptical smoking friends that your request that they not smoke near you is based on solid scientific fact.

Finally, if a member of your family still smokes, especially around a young child, use the EPA's findings to show them how dangerous this can be.

PERSUADE

This document can help you persuade restaurant owners, managers of stores, and others to prohibit smoking.

It will also be especially persuasive with regard to work places because it shows how other business leaders are reacting. It also spells out the possible legal consequences if a business continues to permit smoking after being put on notice by receiving this document.

Stop Being a Passive Smoker

You would not sit quietly by if someone coughed in your face or blew asbestos particles into the air, but most "passive smokers" remain passive when they are forced to inhale a substance which is far more dangerous. As a result, owners, managers, and legislators often have little incentive to ban smoking in public places.

Isn't it time you stopped being so passive!

LEGISLATE

Your elected representatives — including the three in Congress, those in both houses of your state legislature, and those on your local city or county council — may be reluctant to take

effective action against ETS. They need to know that nonsmokers demand protection, and that there is a sound scientific basis for banning smoking. Sending a copy of this document to all of your representatives, together with a letter telling them what you want done, can be the catalyst for a strong law.

REGULATE

Regulatory agencies — such as your state Occupational Safety and Health Administration (OSHA) or local health department — may have jurisdiction over smoking specifically or indoor air quality generally. However, they may be reluctant to act unless they receive a complaint. Even then, they may not be convinced that the problem is serious. This document shows that it is!

ADJUDICATE

When all else fails, people should not be reluctant to seek protection for themselves or their loved ones in court. This document will help persuade judges of the dangers, and provide invaluable assistance to expert witnesses.

IN ADDITION

All people concerned about smoking are encouraged to join and support ASH. A \$20 contribution assures that you will be kept up to date on developments, including new studies, reports, legislation, and steps you can take.

For more information, please mail to ASH, 2013 H St., NW, Wash., DC 20006. This form may be copied.

- ☐ 001 Addiction to Nicotine [\$1]
- ☐ 002 Health Hazards to Smokers [\$1]
- ☐ 003 Cessation and Quitting [\$1]
- ☐ 005 Effects of Passive Smoking [\$1]
- ☐ 010 Smoking and Children [\$1]
- ☐ 020 Women and Smoking [\$1]
- ☐ 100 Workplace Smoking: Costs [\$1]
- ☐ 101 Workplace Nonsmokers' Rights [\$1]
- ☐ 110 Smoking and Apartments [\$1]

- ☐ 120 Smokefree Health Care [\$1]
- ☐ 130 Restaurants and Nonsmoking [\$1]
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FIRST AND LAST NAME _____

COMPLETE ADDRESS _____

CITY _____ STATE _____ ZIP _____ AMOUNT ENCLOSED \$ _____

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Additional information from the EPA Report

ADDENDUM: PERTINENT NEW STUDIES

Several pertinent studies on the respiratory health effects of passive smoking have appeared since the cutoff date for inclusion in this report. The studies are cited here for the benefit of anyone who may wish to follow up on these topics. The studies are briefly described below, and the authors' conclusions are presented. We do not formally review these studies in this report, and the citations do not represent a full literature search. These new studies are generally consistent with this report's conclusions that environmental tobacco smoke (ETS) exposure increases the risk of lung cancer in nonsmokers and affects the respiratory health of infants.

Two of the new studies are case-control studies of ETS and lung cancer in U.S. female nonsmokers (Stockwell et al., 1992; Brownson et al., 1992). Stockwell et al. conclude that "long-term exposure to [ETS] increases the risk of lung cancer in women who have never smoked." Similarly, Brownson et al. conclude, "Ours and other recent studies suggest a small but consistent increased risk of lung cancer from passive smoking."

In an autopsy study of Greeks who had died of causes other than respiratory diseases, Trichopoulos et al. (1992) found an increase in "epithelial, possibly precancerous, lesions" in the lungs of nonsmoking women who were married to smokers. The authors concluded that their results "provide support to the body of evidence linking passive smoking to lung cancer. . . ." In a fourth study, a case-control study of ETS exposure and lung cancer in dogs, Reif et al. (1992) found an association between lung cancer and exposure to a smoker in the home for breeds with short- and medium-length noses. These results are not statistically significant, and the authors characterize their findings as "inconclusive."

Finally, Schoendorf and Kiely (1992) conducted a case-control analysis of sudden infant death syndrome (SIDS) and maternal smoking status (i.e., maternal smoking both during and after pregnancy [combined exposure], maternal smoking only after pregnancy [passive exposure], and no maternal smoking). These investigators conclude that their data "suggest that both intra-uterine and passive tobacco exposure are associated with an increased risk of SIDS."

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MAJOR COMPONENTS OF ETS

VAPOR PHASE

Carbon monoxide
Carbon dioxide
Carbonyl sulfide
Benzene ■
Toluene
Formaldehyde ■
Acrolein
Acetone
Pyridine
3-Methylpyridine
3-Vinylpyridine
Hydrogen cyanide
Hydrazine ■
Ammonia
Methylamine
Dimethylamine
Nitrogen oxides
N-Nitrosodimethylamine ■
N-Nitrosodiethylamine ■
N-Nitrosopyrrolidine ■
Formic acid
Acetic acid
Methyl chloride
1,3-Butadiene ■

PARTICULATE MATTER

Nicotine
Anatabine
Phenol
Catechol
Hydroquinone
Aniline ■
2-Toluene
2-Naphthylamine ■
4-Aminobiphenyl ■
Benz[a]anthracene
Benzo[a]pyrene ■
Cholesterol
γ-Butyrolactone
Quinoline
Harman
N-Nitrosomonicotene
NNK
N-Nitrosodiethanolamine ■
Cadmium ■
Nickel ■
Zinc
Polonium-210 ■
Benzoic acid
Lactic acid
Glycolic acid
Succinic acid
PCDDs and PCDFs

■ = known human carcinogen, according to U.S. EPA or IARC
● = probable human carcinogen, according to U.S. EPA or IARC

MAJOR EPIDEMIOLOGICAL STUDIES

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ASH

SPECIAL REPORT

ACTION ON SMOKING AND HEALTH

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OFFICIAL FEDERAL AGENCY GUIDELINES FOR REGULATING WORKPLACE SMOKING

Environmental Protection Agency

EPA recommends that every company have a smoking policy that effectively protects non-smokers from involuntary exposure to tobacco smoke. Many businesses and organizations already have smoking policies in place but these policies vary in their effectiveness.

- If your company does not have a smoking policy that effectively controls secondhand smoke, work with appropriate management and labor organizations to establish one.

- Simply separating smokers and non-smokers within the same area, such as a cafeteria, may reduce exposure, but nonsmokers will still be exposed to recirculated smoke or smoke drifting into nonsmoking areas.

- Prohibiting smoking indoors or limiting smoking to rooms that have been specially designed to prevent smoke from escaping to other areas of the building are the two options that will effectively protect nonsmokers. The costs associated with establishing properly designed smoking rooms vary from building to building, and are likely to be greater than simply eliminating smoking entirely.

- If smoking is permitted indoors, it should be in a room that meets several conditions:

- Air from the smoking room should be directly exhausted to the outside by an exhaust fan. Air from the smoking room should not be recirculated to other parts of the building. More air

should be exhausted from the room than is supplied to it to make sure ETS doesn't drift to surrounding spaces.

- The ventilation system should provide the smoking room with 60 cubic feet per minute (CFM) of supply air per smoker. This air is often supplied by air transferred from other parts of the building, such as corridors.

- Nonsmokers should not have to use the smoking room for any purpose. It should be located in a non-work area where no one, as part of his or her work responsibilities, is required to enter.

- Employer-supported smoking cessation programs are an important part of any smoking policy. Approximately 25 percent of American adults still smoke. Many smokers would like to quit, but cigarette smoking is physically and psychologically addictive, and quitting is not easy. While working in a smoke-free building may encourage some smokers to quit, a goal of any smoking policy should be to actively support smokers who want to kick the habit.

- If there are designated outdoor smoking areas, smoking should not be permitted right outside the doors (or near building ventilation system air intakes) where nonsmokers may have to pass through smoke from smokers congregated near doorways. Some employers have set up outdoor areas equipped with shelters and ashtrays to accommodate smokers.

Verbatim from "Secondhand Smoke," 402-F-004, July 1993, emphasis added.

National Institute for Occupational Safety and Health

Workers should not be involuntarily exposed to tobacco smoke. To prevent worker exposures to any hazardous substance, employers should first eliminate hazardous workplace emissions at their source. If elimination is not possible, emissions should be removed from the pathway between the source and the worker. Therefore, the best method for controlling worker exposure to ETS is to eliminate tobacco use from the workplace and to implement a smoking cessation program. Until tobacco use can be completely eliminated, employers should protect nonsmokers from ETS by isolating smokers.

In indoor workplaces where smoking is permitted, ETS can spread throughout the airspace of all workers. The most direct and effective method of eliminating ETS from the workplace is to prohibit smoking in the workplace. Until that is achieved, employers can designate separate, enclosed areas for smoking, with separate ventilation.

Air from this area should be exhausted directly outside and not recirculated within the building or mixed with the general dilution ventilation for the building. Ventilation of the smoking area should meet general ventilation standards, and the smoking area should have slight negative pressure to ensure airflow into the area rather than back into the airspace of the workplace (ASHRAE 1989).

Excerpts from "Environmental Tobacco Smoke in the Workplace," Pub. 91-108.

Mr. WAXMAN. Thank you for your testimony, all of you. You've given us a lot of useful information. It's been very helpful for us.

Dr. Smoak, you are here representing the American Medical Association, one of the most respected organizations in this country in terms of medical policy. Is it the view of the AMA that environmental tobacco smoke is a major environmental threat facing the average American?

Mr. SMOAK. Yes, sir. It is a subject that's been reviewed by our Council on Scientific Affairs and our Medical Group within our organization. It is obvious that there is a strong correlation there. We have a very deadly problem that we're dealing with.

Mr. WAXMAN. In your testimony, you say that environmental tobacco smoke kills 50,000 Americans each year. In comparative risk terms, how serious does this raise the issue of environmental tobacco smoke? Is it one of the leading causes of death in the United States?

Mr. SMOAK. It would be.

Mr. WAXMAN. What is higher?

Mr. SMOAK. We are seeing alcoholism or the direct smokers themselves who are dying at a greater rate.

Mr. WAXMAN. We had, at the previous meeting of the subcommittee, the Surgeon General of the United States and all the previous Surgeons General for the last, I think, four administrations. They indicated to us that they thought that H.R. 3434 was the most important initiative in disease prevention to come before the Congress in many years.

Would the American Medical Association agree with that statement?

Dr. Smoak. Yes, sir. We believe it is a very, very important piece of legislation.

Mr. WAXMAN. I appreciate the testimony of the American Medical Association and I would hope that this organization, which cares so deeply about preventive health care, will be one that we can count on to help us secure passage of this legislation.

Mr. SMOAK. I'm sure we will support it in whatever way is feasible in view of all the other issues before you, as you mentioned before, with health system legislation, et cetera, et cetera.

Mr. WAXMAN. Mr. Cole and Mr. Naylor, you are my constituents and I'm pleased to welcome you here, although you are here at the recommendation of my colleague, Mr. Bliley. I guess it was because you are not supporting my bill.

But you have talked in terms of the fact that you're involved in the restaurant business. All the organizations involved in restauranting, if that's the correct way to put it, have written us and taken a position in favor of the bill. The National Council of Chain Restaurants, which represents 40 chains made up of 90,000 individual restaurants, 2 million people work in their restaurants. They say, and I quote, "We're proud to endorse this legislation as a fair and comprehensive resolution to the issue of smoking in places of public accommodation."

Another group, the California Restaurant Association, represents 10,000 restaurants in California. They have sent me a letter saying that—the California Restaurant Association says that "Local jurisdictions have adopted local ordinances which create a network of

inconsistent laws throughout the State, thereby creating uneven and noncompetitive situations." They say the answer is even-handed regulation nationwide and they supported our legislation.

This week another State restaurant association, the Restaurant Association of Maryland, adopted a resolution supporting H.R. 3434 on behalf of its 2,000 members, and, of course, many individual restaurants, McDonald's, Arby's, Dairy Queen and Taco Bell just went smoke-free, as well.

The organizations that represent restaurants have taken a different position. My concern, however, is you as two constituents and I guess you can't always agree, but I must tell you I agree with those restaurant organizations.

I would like to ask you——

Mr. NAYLOR. Would you like me to respond to that?

Mr. COGGINS. We both have a response.

Mr. WAXMAN. It wasn't a question.

Mr. COGGINS. Well, we have a comment.

Mr. NAYLOR. Whatever your pleasure, Mr. Chairman. I would like to read——

Mr. WAXMAN. We've already had your testimony. You don't agree with this legislation, Mr. Naylor. I know you have restaurants. Mr. Cole, as I understand it, you've never been in the restaurant business, but you're an attorney, is that correct?

Mr. COLE. No. I'm not an attorney, but I was asked by the Beverly Hills Restaurants to represent them during our battle for repeal in Beverly Hills. If I could just make a quick comment. The restaurants that you listed are all fast food restaurants. Many of our restaurants and dinner houses do not belong to these associations. Many of them receive a good part of their support from fast food restaurants and from the chain restaurants.

The economic impact on them is quite different than a restaurant that wants you to stay.

Mr. WAXMAN. I understand that. Have you been employed by the tobacco industry?

Mr. COLE. No. I haven't been employed by the tobacco industry, but certainly the tobacco industry has given support to the organizations that I've been involved with. Not the Beverly Hills Restaurant Association, however.

Mr. WAXMAN. Given support, you mean financial support?

Mr. COLE. Yes.

Mr. WAXMAN. So they are funding organizations that come in to make the argument on behalf of restaurants.

Mr. COLE. Not enough. I'd like more support.

Mr. WAXMAN. You'd like them to pay more. For the economy of our region, I hope they do more, as well. They're just out to win their fights.

Mr. Naylor, very briefly, because I've got——

Mr. NAYLOR. I'll do it quickly. I am nonsmoking in those restaurants. So I hope that came across, except for the outdoor patios and that's by choice and these aren't fast food.

My brothers, who operate coffee shops, have nonsmoking sections as accommodations. The restaurant industry has a great variety of different restaurants within that industry, businesses within that

industry, and they all have different positions, as Mr. Cole has stated.

The National Restaurant Association also has a position as a body that represents some 28,000-plus member firms, over 200,000 restaurants, about half the people, 4 million-plus, working in the United States. That is, very simply, that they firmly believe the decision on allowing smoking should be the responsibility of each different restaurant and his business. You will find more and more restaurants adopting this no-smoking. Smoking is a dying thing, but legislation, at least not this legislation as currently constituted, is the answer.

Mr. WAXMAN. Let me indicate I'm informed that the National Restaurant Association has taken no position on this bill, although the California Restaurant Association has come out for it and they're urging that—

Mr. NAYLOR. Yes. I am the past president of the California—I'm wearing both hats here. I have voted with California on one side and with the National on the other. Our industry is just like that. There are a great many different positions on not only this bill, but this issue.

Mr. WAXMAN. I appreciate that. I just want to ask one question of Dr. Carter, and then I'm going to have to run and catch a vote. I'm struck about how hard you've had to fight this whole issue. You talked about your experiences when you were lobbying the State legislature. I think your testimony demonstrates why we need a national law.

It's time-consuming. It's inefficient to fight out. Smoking controls in local jurisdiction after local jurisdiction, when we could have as simple national law that protects everybody. Do you agree?

Mr. Carter. That's right. I think part of the problem is the tobacco cartel propaganda campaign, which has really been ongoing since 1978, has recommended, and this is all in my testimony, that they adopt this strategy position to counter the ETS data that were coming out at that time.

Two points, I think, to respond to the testimony that was given here. One is that these front industry groups that have been mentioned here in California are fully funded by the tobacco industry. It turns out that the data that was used to overturn some of the California ordinances, saying, oh, there was a 30 percent drop in business, were phoney data.

It has been reported since, in October, by Dr. Glantz from the University of San Francisco, that on long-term clearcut review of the sales tax receipts, that was not the case. Where smoke-free ordinances have been passed, there has been no significant decline in business. So that is another misrepresentation.

The other is that I have been a cancer specialist for about 5 years. After my training at what I feel is one of the best cancer centers in the world, Duke University, not to mention its basketball team, but I guess I must be dreaming because some of this data that was presented from the R.J. Reynolds researcher didn't mention the number one risk factor—cigarette smoking—for lung cancer and mentioned factors such as high fat diet, citrus fruits, three glasses of milk.

I think those are completely false. You are being misled. I am a Board-certified cancer specialist. I have specifically focused on the study and treatment and research of lung cancer while at Duke University and since. These are misleading statements, which I believe is the pattern of the tobacco industry, and that has been published in the AMA Journal as a sponsored symposia on environmental tobacco smoke, where the industry funds its own symposia or meetings, brings in many "researchers" who they have paid to—

Mr. WAXMAN. Yes. Well, it must be particularly galling to you because you work in the field. Let me say in my field, as an elected official, I've been in State legislature as well as in Congress. When an issue like this is up before the State legislature, groups say this shouldn't be done on a State basis, it ought to be done on a Federal basis.

When we come up here and have some of these very same issues, we get the argument this is not a Federal, it ought to be handled as a State or a local matter. You can be sure the tobacco industry is weighing in heavily everywhere in order to try to stop these regulations.

This fight is one, I think, where we have the public health and children on one side and the tobacco industry on the other. I don't really see anything different than that.

I'm going to have to leave now because there's a vote on the House floor. I want to thank Dr. Hall and Dr. Tooker for being here. Dr. Hall mentioned another aspect of this thing with regard to fire problems and I want to point out for the record that the International Association of Fire Chiefs is also endorsing this bill.

We're going to break now and—

Mr. CARTER. Mr. Chairman, I just want to submit that all the material, along with my written testimony, which includes all the medical articles from several journals, letters that have been written by me and to others, as well as newspaper articles supporting these issues, are here for the record.

Mr. WAXMAN. Without objection, we will receive those.

[The documents referred to may be found in the file record of the subcommittee.]

Mr. WAXMAN. We will reconvene in this room at 2 p.m.

[Whereupon, at 12:50 p.m., the hearing was recessed, to reconvene this same day at 2 p.m.]

AFTER RECESS

Mr. WAXMAN. The meeting of the subcommittee will come to order. We want to welcome our witnesses for this fourth panel. Albert C. Eisenberg, senior director, Federal legislative affairs, American Institute of Architects; Dr. Michael Maves, associate executive vice president of the American Academy of Otolaryngology; Gray Robertson, president, Healthy Buildings International; Mark Pertschuck, co-director, Americans for Non-Smoker Rights; Dr. H.A. Divine, professor and director, School of Hospitality Management and Tourism, University of Denver; and Martha Perske.

We are pleased to have you all with us today. Your prepared statements will be in the record in full. What we'd like to ask each of you to do is to limit the oral presentation to 5 minutes.

Mr. Eisenberg, why don't we start with you?

STATEMENTS OF ALBERT C. EISENBERG, SENIOR DIRECTOR, FEDERAL LEGISLATIVE AFFAIRS, AMERICAN INSTITUTE OF ARCHITECTS; MICHAEL D. MAVES, ASSOCIATE EXECUTIVE VICE PRESIDENT, AMERICAN ACADEMY OF OTOLARYNGOLOGY; GRAY ROBERTSON, PRESIDENT, HEALTHY BUILDINGS INTERNATIONAL; MARK PERTSCHUCK, CO-DIRECTOR, AMERICANS FOR NON-SMOKERS RIGHTS; H.A. DIVINE, DIRECTOR, SCHOOL OF HOSPITALITY MANAGEMENT AND TOURISM, UNIVERSITY OF DENVER; AND MARTHA PERSKE, DARIEN, CONN.

Mr. EISENBERG. Thank you, Mr. Chairman. My name is Albert C. Eisenberg, senior director of Federal legislative affairs for the American Institute of Architects. The AIA, with 56,000 members, is the professional association representing the Nation's architects. Accompanying me today is David Bullen, an architect and AIA's director of building performance and regulations.

I would also note that I'm a local elected official, currently vice chairman of the Arlington, Va. County Board, which governs this community of 180,000 residents. I have fought for smoking restrictions within the very limited authority the State of Virginia, a tobacco-growing State, gives to localities in this field. And I am an ex-smoker.

The AIA is grateful for the opportunity to appear today. We endorse your legislation enthusiastically. We believe it's going to save lives, save money, and protect the right of people to use public spaces without suffering a lethal health hazard just to accommodate somebody else's convenience or habit.

Buildings are complex systems and becoming more so. Architects have become increasingly aware of how building design and construction, along with the interaction of their systems together, produce an indoor ecology that has a profound effect on people's health and productivity, especially since we all spend 90 percent of our lives indoors.

We are paying increasing attention to two phenomena of modern buildings. One is sick building syndrome, where people get headaches, dizziness or other symptoms from some unknown source and can get relief by going outside. The other is building-related illness, where people get sick from a known source and can't get immediate relief. Legionnaire's Disease is an example. Gases, vapors, particles from such things as paints, carpets, construction materials, tobacco, can permeate the indoor atmosphere and can make people ill.

So can bacteria that find a home inside or are drawn in by poorly ventilated systems, poorly maintained systems. Architects care about the health of people that use the buildings they design. Architects can make a difference in the indoor environment by how they site or orient a building, design its overall architecture, specify ventilation and climate controls, and select construction and finishing materials.

But there are limits to the effectiveness of design and protecting indoor air quality. Architects have no control over how a building is maintained and used or the upkeep of the ventilation systems. There are literally millions of buildings that have never seen and will never see the services of an architect or an engineer or any-

body else that can do anything about indoor air quality, and they are filled with indoor pollutants.

Tobacco smoke presents a special challenge to architects. Our members confront it as one of the most prevalent indoor contaminants. Each year, some 467,000 tons of tobacco are burned indoors. It's highly toxic, as previous witnesses have indicated. It harms people, as they have indicated. There is no established health threshold for tobacco smoke and EPA recognizes no safe level for it.

There are two ways to deal with tobacco smoke. You can ventilate it or filter it or you can prohibit it. The most current nationally accepted ventilation standard is called ASHRAE 62-1989. It specifies ventilation rates for different spaces of different size. The ventilation rate is the amount of cubic feet of air brought into the building from the outside in cubic feet per minute per person.

Typically, the ventilation rate for indoor spaces ranges up to 20 to 25 cfms. For smoking lounges, the rate is up to three times that. Yet, the standard cannot guarantee that there still won't be health problems.

Environmental smoke cannot be totally removed from the indoor air, except by removing the smoking itself. Separation of smokers and non-smokers only reduces the problem because the pollution disbursts through a common space. Most ventilation systems in public facilities recirculate air because of the heat and cooling needs.

The most effective way to deal with tobacco smoke is to do what the legislation requires. With most pollutants, the source is hard to identify and locate. The opposite is true with tobacco smoke. We know where it comes from, and that makes it perhaps the easiest pollutant to eliminate.

In closing, I've got three comments on the provisions. First, the 1-year transition between the date of enactment and the date of passage is a good one. It mirrors the way that other laws, like the ADA and the Fair Housing Amendments Act, treat changes to public spaces required by Federal law. Second, in requiring a standard for ventilation, the legislation should reference the ASHRAE standard or any successors as it evolves rather than have the Federal Government try to develop a whole new one.

Third, don't exempt all residential buildings. Only buildings of four units or less and, in larger buildings, only the portion that's used for residential purposes. Otherwise, you're going to leave out important work spaces and public areas and possibly hotels, which, in a number of local zoning laws, are often classified as residential buildings.

That concludes my testimony and I await your questions. Thank you.

[The prepared statement of Mr. Eisenberg follows:]

STATEMENT OF ALBERT C. EISENBERG

Mr. Chairman, and members of the subcommittee, my name is Albert C. Eisenberg, Senior Director for Federal Legislative Affairs for The American Institute of Architects (AIA), the professional organization of 56,000 members representing the nation's architects. This year the AIA celebrates its 137th anniversary.

I would also like to note that I am a local elected official, currently serving as Vice-Chairman of the Arlington, Virginia, County Board, the governing body for this urban community of 180,000 people. In that capacity I have worked within the limited authority allowed us under state law to increase restrictions on smoking in public places.

We appreciate this opportunity to comment on H.R. 3434, "The Smoke-Free Environment Act." The AIA enthusiastically supports the thrust of your legislation. It will accomplish many benefits. It will save lives, increase worker productivity, save insurance and other business costs, and guard the rights of non-smokers who must now suffer a lethal hazard to accommodate the convenience or habit of others.

Architects have an intimate relationship with all aspects of the built environment. Through their skill and their imagination, they create the buildings and structures in which the wide range of human endeavor finds expression. In making this contribution, it is always their goal to make each space perform for people, with respect for their humanity and with care for their comfort and safety. The places that invite and serve the public, including retail stores, theatres, schools, restaurants, offices, and gyms, to name several, bear a special responsibility for the well-being of their occupants and visitors. People must go to these places as a normal part of daily life. They should not be placed in jeopardy for doing so.

As the science of design and construction have become more complex, architects have become more aware of the effects of the indoor environment on people's health. Considering that people spend, on the average, 90 percent of their lives indoors, the wholesomeness of that environment takes on profound importance. Architects are paying increasing attention to two phenomena that have been identified in modern buildings. One is called "sick building syndrome". This effect occurs when people experience such problems as headaches, dizziness, nausea, or fatigue and find relief by going outside, but the symptoms cannot be traced to any particular source. The other phenomenon is called "building-related illness". It results in such maladies as Legionnaire's disease. Building related illness cannot be solved just by leaving the building, and can be attributed to a particular contaminant.

Gases, vapors, and particles from such sources as paints, varnishes, carpets, insulation, construction materials, and tobacco smoke can permeate the interior atmosphere making people sick. Bacteria that find a home in hospitable places inside or which are drawn in through poorly maintained ventilation systems can also make people sick.

Architects attempt to alleviate these problems in several ways, generally grouped under four categories: 1) site planning, 2) overall architectural design, 3) ventilation and climate controls, and 4) materials selection and specification.

Architects can reduce the potential for indoor air pollution that results from the invasion of outside contaminants like gasoline fumes, radon, and particulate matter. The way a building is sited or oriented and the way that traffic is routed can reduce the impact of these substances.

Architects can incorporate more open windows, moving away from the sealed windows that so many large, new buildings feature. Balanced approaches can be developed that allow operable windows to work in harmony with sophisticated ventilation systems designed to deliver air to all parts of a building's interior.

Architects can specify low-pollution materials, keep vehicular access adequately separated from entrances and air intakes, and make special provisions for polluting activities. They can isolate fax machines, copiers, printers, and activities such as printing which generate particulate and chemical pollution. Smoking can also be isolated, as H.R. 3434 provides for those places where it is not prohibited altogether.

They can also pay particular attention to the optimum design of ventilation systems, assuring the appropriate location of air intakes. They can specify air cleaning and filtration where outdoor air is contaminated, control for the invasion of microbes through the ventilation system, and seek adequate distribution of outside air to building occupants, relating ventilation rates to both human density and the kinds of activities in which building occupants will be engaged.

And they can address the pollution potential of new or renovated spaces, by taking such steps as specifying extra ventilation just before and right after initial occupancy, or the use of what is known as "bakeout". This involves raising the temperature of the building for two days or more to reduce contaminant concentrations.

But there are limits to these design techniques. For one thing, the design of ventilation systems does not guarantee that they will be properly maintained and kept in good operating condition. For another, outside air brought into a building unfiltered may not be clean. Some substances, like chemicals and pesticides, are beyond the reach of the architect. So is the operation of the facility. In addition, many existing public accommodations and workplaces were not built with the services of an architect; or were designed for a different use from the current one; or have deteriorated or have been illegally or expertly altered, and as a result contain significant amounts of indoor air pollution that architectural services will probably never reach.

When it comes to the pollutant of tobacco smoke, architects face several challenges. First, tobacco smoke is one of the most prevalent of indoor contaminants. Over 50 million people smoke about 600 billion cigarettes a year, along with 4 billion cigars, and 11 billion pipesful of tobacco. Some 467,000 tons of tobacco are burned indoors. Tobacco smoke is highly toxic, containing 4700 chemical compounds, including benzene, formaldehyde, arsenic, ammonia, vinyl chloride, and hydrogen cyanide.

Now classified as a known carcinogen in its passive form, tobacco smoke contains 42 carcinogenic compounds, and according to the Environmental Protection Agency (EPA), environmental tobacco smoke is the major source of indoor mutagenic substances--which are compounds that cause permanent, often harmful, changes in genetic material of cells. As you know, each year passive smoking kills 3000 people a year, and is responsible for up to 300,000 lower respiratory tract infections among children aged 18 months or less, resulting in as many as 15,000 hospitalizations. It also increases asthmatic episodes among as many as 1 million asthmatic children.

Among restaurant workers, the dangers of environmental tobacco smoke are great, again particularly for teenagers/young adults. The fast food industry estimates that 40 percent of fast food restaurant workers are aged 18 or less, and studies indicate that the level of second-hand smoke in these places is 1.6 to 2 times higher than in offices, and 1.5 times higher than in residences with at least one smoker. In addition, as many as 25 percent of fast food customers are under age 18 and 10 percent below age 10.

Field studies, controlled experiments, and mathematical models show that under typical conditions of smoking and ventilation, environmental tobacco smoke diffuses rapidly throughout buildings. Tobacco smoke produces major amounts of particulate matter. In areas of public or commercial buildings where smoking is permitted, particulate levels are considerably higher than in non-smoking areas.

It is important to stress that there is no established, health-based threshold for exposure to environmental tobacco smoke. EPA does not recognize a safe level for the substance.

The most current, nationally-accepted standard for ventilation is known as ASHRAE 62-1989, developed by the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE). The purpose of the standard "is to specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to avoid adverse health effects." It is interesting to note that the ventilation rate is typically 15 to 20 cubic feet of outdoor air per minute per person (cfm's). For smoking lounges, however, the recommended rate is 60 cfm's, three times the highest rate prescribed for other spaces. The standard "does not, and cannot, ensure the avoidance of all possible adverse health effects..."

The fact is that environmental tobacco smoke cannot be totally removed from the indoor air except by removing the smoking itself. Separation of smokers and non-smokers in the same room only reduces the smoke problem. Pollutants disperse through a common space and most ventilation systems in public and commercial spaces recirculate much of the contaminated indoor air.

The AIA thus concludes, as does the legislation that the most effective way to minimize the hazards of environmental smoke in public facilities is to restrict smoking to areas that are separately ventilated and directly exhausted to the outside, or by eliminating smoking in the building entirely. While some indoor air pollutants can be difficult to identify or locate, the opposite is true for tobacco smoke. In that sense, it is the easiest pollutant to eliminate.

In endorsing the legislation, we have comments and suggestions on several specific provisions.

First, Section 2705 provides a transition period of one-year between the date of enactment and the effective date of the legislation, which is appropriate. In this regard, it mirrors other laws, such as the Fair Housing Amendments Act and the Americans with Disabilities Act, which give businesses and others ample time to accommodate changes in their policies or in their premises. It is worth noting that those that are unable to establish separately ventilated spaces by the effective date can comply with the act by prohibiting smoking until such time as they ready their premises with separate ventilation systems.

Second, Section 2701 (c)(1), which provides for ventilation specifications promulgated by the EPA Administrator, should be modified. While we agree that ventilation standards should be established, we do not believe that the Administrator should be charged with creating a new standard to replace the one that is already nationally-recognized and accepted, the ASHRAE 62-1989. A stand-alone federal standard for ventilation that supplant's or exists side-by-side with the ASHRAE standard will introduce unnecessary complexity into building design and construction. ASHRAE 62-1989 represents broad consensus among architects, engineers, builders, government officials, inspectors and others who participate in its development and evolution.

Third, Section 2706, which concerns definitions, should also be modified. As drafted, it exempts buildings used for residential purposes. This provision would thus exempt important public areas or workplaces typically found in multi-family projects, such as offices, reception areas, lounges, recreation or multi-purpose rooms open to the public, and dining rooms. In addition, in many zoning laws, hotels are considered residential buildings. The provision should be changed to exempt those portions of buildings used for residential purposes, thereby separating places where private, personal consumption of tobacco products can take place, from those places that are open to the public. This change would not eliminate smoking entirely in these places, but it would fine-tune the broad exemption of the current provision.

Mr. Chairman, this concludes my testimony. I am happy to answer any questions you may have.

Mr. WAXMAN. Thank you very much, Mr. Eisenberg. Dr. Maves.

STATEMENT OF MICHAEL D. MAVES

Mr. MAVES. Thank you. Mr. Chairman, I would like to thank you for providing me with this opportunity to address the importance of protecting our Nation's children and adults from the dangers of secondhand smoke. I am Dr. Michael Maves, associate executive vice president of the American Academy of Otolaryngology and a practicing otolaryngologist.

On behalf of the academy, I'm here to ask that this subcommittee and the Congress pass H.R. 3434, the Smoke-Free Environment Act of 1993, and protect the Nation's children from unnecessary exposure to secondhand smoke. The academy is the world's largest organization of physicians dedicated to the care and treatment of diseases and disorders of the ears, nose, throat and related structures of the head and neck.

Secondhand smoke has contributed to so many medical complications treated by our membership that the academy recently kicked off a national campaign in January, with Joan Lunden of Good Morning America as our national spokesperson, to educate the public about the hazards of secondhand smoke and its effects on children.

I would add that Ms. Lunden regrets not being able to be here this afternoon. However, some of you should have received a letter signed by her and two members of our academy asking for your support of this measure.

The academy now has over 100 members throughout the country who are addressing schools and civic groups about this issue in an effort to protect the Nation's children. We have also produced an award-winning video about environmental tobacco smoke, a copy of which I have with me, which recently ran on the House of Representatives' broadcast channel last month.

The statistics, in fact, about the impact of secondhand smoke on children's health are staggering. Tobacco smoke aggravates, if not causes the incidence of numerous medical conditions, such as asthma, allergies, chronic bronchitis, middle ear infections, pneumonia and cancer. It also increases the number of attacks and severity of asthma in about 1 million of the Nation's 2 million asthmatic children.

A 1992 study by the Environmental Protection Agency indicates that environmental tobacco smoke causes 150,000 to 300,000 cases of bronchitis, pneumonia and other respiratory tract infections in infants and children under 18 months of age each year. More specifically, environmental tobacco smoke is causally associated with a significant reduction in lung function, which can occur in all children.

More commonly secondhand smoke increases both the number of ear infections a child will experience and the duration of illness. Inhaled smoke irritates the eustachian tube, which connects the back of the nose with the middle ear, leading to fluid, pain and infection. Ear infections are the most common cause of childhood hearing loss and when they do not respond to medical treatment, they may require insertion of tympanostomy tubes to ventilate the ears in these children.

Public opinion indicates that it's time to ensure safe environments for all Americans. In a public opinion poll conducted last November by the Opinion Research Corporation for the American Academy of Otolaryngology, 76 percent of the persons polled strongly agree that secondhand smoke is a serious health hazard for our children. Only 8 percent of the polling group disagreed on some level that tobacco smoke is harmful to children.

Exposing infants and children to secondhand smoke is nothing short of the highest form of selfishness. Adults have the option to smoke or not to smoke. Children are legally prohibited from purchasing tobacco products; yet, many of them are subjected to the dangers of tobacco smoke because their parents, teachers and other individuals around them refuse to stop smoking in their presence.

Given the overwhelming evidence, it seems unnecessary to even question that such legislation as this should be implemented. To a child with asthma, as we saw this morning, or any other respiratory problem, exposure to secondhand smoke can lead to debilitating situations, making it almost impossible to sit in a restaurant or walk through a shopping mall.

When the subcommittee, committee and Congress vote on this bill, you will be voting on whether or not to allow children and adults to breathe clean air, have strong lungs and lead healthy lives.

This country is currently deep in debate about health care reform, focusing on the need for primary and preventive care. This bill would be the perfect opportunity to help children get a fair start at leading a healthy life by preventing many problems.

Thank you for this opportunity to participate in this afternoon's hearing. I'd be pleased to answer any questions.

[The prepared statement of Mr. Maves follows:]

STATEMENT OF MICHAEL D. MAVES

Mr. Chairman, thank you for providing me with this opportunity to address the importance of protecting our nation's children and adults from the dangers of secondhand smoke. I am Dr. Michael Maves, Associate Executive Vice President of the American Academy of Otolaryngology-Head and Neck Surgery.

On behalf of the Academy, I am here to ask that all members of the Congress, and specifically this Subcommittee pass H.R. 3434, "The Smoke Free Environment Act of 1993," and protect the nation's children from unnecessary exposure to secondhand smoke.

The Academy is the world's largest organization of physicians dedicated to the care and treatment of diseases and disorders of the ears, nose, throat, and related structures of the head and neck. Many of my colleagues frequently care for patients with conditions such as asthma, allergies, chronic bronchitis, middle ear infections, pneumonia, and cancer which have been aggravated, if not caused by, exposure to secondhand smoke. Secondhand smoke has contributed to so many medical complications treated by our membership that the Academy kicked-off a national campaign in January, with Joan Lunden of *Good Morning America*, as our national spokesperson, to educate the public about the hazards of secondhand smoke, and its effect on children. I would like to add that Ms. Lunden regrets not being able to be here this morning; however, some of you should have received a letter signed by her and two members of our Academy asking for your support of this measure. The Academy now has over 100 members throughout the country who are addressing schools and civics groups about this issue in an effort to protect the nations' children. We have also produced an award-winning video about environmental tobacco smoke which ran on the House of Representative's broadcast channel last month.

The statistics and facts about the impact of secondhand smoke on children's health are staggering. Tobacco smoke increases the number of children's colds and sore throats, and aggravates sinusitis, rhinitis, cystic fibrosis, and coughs and postnasal drips. It also increases the number of attacks and severity of asthma in about one million of the country's two million asthmatic children. A 1992 study by the Environmental Protection Agency (EPA) indicates that environmental tobacco smoke causes 150,000 to 300,000 cases of bronchitis, pneumonia and other respiratory tract infections in infants and children under 18 months of age each year. More specifically, environmental tobacco smoke is causally associated with a significant reduction of lung function which can occur in all children.

More commonly, secondhand smoke increases both the number of ear infections a child will experience, and the duration of the illness. Inhaled smoke irritates the eustachian tube, which connects the back of the nose with the middle ear, leading to pain, fluid and infection. Ear infections are the most common cause of children's hearing loss. When they do not respond to medical treatment, surgical (and sometimes painful) insertion of tubes into the ears is often required.

After the release of its study on Environmental Tobacco Smoke (ETS), the EPA announced on July 21, 1993, a new federal policy recommending that "every company have a smoking policy that effectively protects non-smokers from involuntary exposure to tobacco smoke." EPA Administrator Carol Browner indicated that two options exist to effectively

protect nonsmokers from exposure to environmental tobacco smoke. They are: banning smoking indoors, and restricting smoking to separately ventilated rooms.

Public opinion and the support of the business world, as is evidenced by the group of organizations gathered here today, strongly indicate that it is time to ensure safe environments for all Americans. In a public opinion poll conducted last November by the Opinion Research Corporation for the American Academy of Otolaryngology-Head and Neck Surgery, 76% of the persons polled strongly agree that secondhand smoke is a serious health hazard for children. Only eight percent of the polling group disagreeing, on some level, that tobacco smoke is harmful to children.

The business community has already expressed its support for H.R. 3434. The National Council of Chain Restaurants (including Dunkin' Donuts and Hardee's), and the Building Owners and Managers Association have both expressed endorsement of the legislation. McDonald's is not only supporting the bill, but is making all of its 1,400 company-owned restaurants smoke-free. Shopping malls and airports are also taking the same approach as McDonald's. Unfortunately, there still remain hundreds, if not thousands of day care centers and homes where smoking is allowed. Exposing infants and children to secondhand smoke is nothing short of the highest form of selfishness. Adults have the option to smoke or not to smoke. Children are legally prohibited from purchasing tobacco products, yet many of them are still subjected to the dangers of tobacco smoke because their parents, teachers, and other people around them refuse to stop smoking in their presence.

Given the overwhelming evidence, why is it necessary to even question if legislation such as "The Smoke-Free Environment Act of 1993" should be passed and implemented? To a child with asthma, or any other respiratory problem, exposure to secondhand smoke can lead to debilitating situations making it almost impossible to sit in a restaurant, or walk through a shopping mall. When the Subcommittee, Committee and Congress vote on this bill, you will be voting on whether or not to allow children and adults to breathe clean air, have strong lungs, and lead a healthy lives.

This country is currently steeped in debate about health care reform, and focusing on the need for primary and preventive care. This bill would be the perfect opportunity to help children get a fair start at leading a healthy life.

The Academy would like to see all Americans stop smoking; however, more significantly it is imperative that children are protected from environmental tobacco smoke. It is the responsibility of every person in this room, and every member of the Congress to protect children from this intrusive and permanently destructive threat against their health.

Thank you for this opportunity to participate in this morning's hearing. I would be pleased to answer any questions.

Mr. WAXMAN. Thank you very much, Dr. Maves. Mr. Robertson.

STATEMENT OF GRAY ROBERTSON

Mr. ROBERTSON. Mr. Chairman, ladies and gentlemen, my name is Gray Robertson. I am the president of Healthy Buildings International. Mr. Banzhaf, in the prior session, mentioned the fact that I've had some notoriety because I appeared on NBC, admitting that I do consulting work for the tobacco industry. He failed to point out that I also consult for the Department of Health and Human Services, United Nations, GTE, Pepsi-Cola, IBM, 300 major corporations.

We have studied over 1,000 major buildings throughout this country. In many of the buildings we've studied, we've been asked about the issue of tobacco smoke in those buildings. I would point out that a percentage of the buildings practice discretionary smoking. Some of them have total bans. Others have smoking restricted to designated areas. Every single one of these is satisfied with the air quality in their buildings.

How can that be when we have three conflicting techniques and all expressing the same degree of satisfaction? The answer is because all of them practice the correct levels of ventilation and filtration in the building and it does adequately cope with tobacco smoke.

The fact is that more people today are concerned about tobacco smoke because of the EPA's classification that it is a Class A carcinogen. In fact, Mr. Banzhaf previously said that because it is a Class A carcinogen, there is no safe level. Why are you separating safe levels of other carcinogens and not for tobacco smoke? Asbestos and benzene, as cited, do have so-called safe levels.

OSHA, who has the responsibility for regulating these substances, uses permissible exposure limits, levels below which every worker can be exposed day after day, without apparent adverse health effects. Why not the same for environmental tobacco smoke?

I think I'd like to jump a little in my testimony. I know it's submitted in writing. The issue that you seem to be holding great sway on is some of the savings that you think you will be getting once you ban smoking in buildings. In fact, the EPA made the statement that, and I quote, "In addition, a substantial potential saving in housekeeping and maintenance expenses of buildings seems to be possible as a result of a smoking ban and could be in the \$5 to \$10 billion range."

I think the words "seems to be" and "could be" are to preserve plausible deniability later, because when I have examined those figures in detail, I can point out to you that they were based on some appalling assumptions, assumptions such as it takes 46—you have to vacuum carpets 46 percent more frequently in smoking than nonsmoking. You have to dust areas every 3 days in smoking and you can do it every 5 days in nonsmoking.

And when you extrapolate these figures, you find that they are making claims that just emptying ashtrays in buildings in this country costs \$2.4 billion. Now, I have difficulty accepting that figure. So I spoke to the chief executives at the largest cleaning corporations in the country and asked them for their views.

First of all, they point out that the total cost of cleaning a commercial building in this country averages \$1 per square foot. Is someone going to try and make me believe that you can save 11 cents a square foot just because there's no smoking in the building? I asked these executives. They said no, there would be no reduction whatsoever.

The other major saving was painting. Believe it or not, the EPA said in a smoking environment, you have to paint it every 6 years. In a non-smoking environment, you paint it every 12 years. They multiplied that difference by 61 billion square feet of property and said, therefore, we now save \$4 billion a year.

The fact is this is nonsense. The average lease of any property in this country is 5 years. Every building space is painted, on average, every 5 years, whether there's smoking or not. There is no saving. Indeed, we can now look and say just accept using the same logic that the EPA used, but what happens if, in fact, you did have a total ban on a large building.

If you have a building of, say, 100,000 square feet, a typical 10-story building that houses, on average, 600 people, if we accept 25 percent of those people smoke, that's 150 people. If they have to go outside the building to smoke, let's assume they did it just four times a day. To leave the office, take an elevator ride, go outside the building, come back in, go back to their space, let's assume they did it in 10 minutes 4 times a day. That's 600 minutes by the 150 people.

It happens to be exactly 2 percent of the productive day in that office, the 600 people. Therefore, if you look at the salary rates and you assume we pay these people \$30,000 per year per person, you're looking at costs of \$360,000 a year in lost productivity in one building of 100,000 square feet. Now, if I do the EPA's trick of multiplying that by 61 billion square feet, my productivity losses are \$219 billion.

Do I believe that? No. I don't believe the EPA's figures, either. The fact is there is no significant difference in cleaning and operating costs in buildings. If there were, why haven't the costs of cleaning government buildings gone down over the last 5 years as smoking bans have been introduced in your buildings? They've all gone up. Yet, commercial buildings have maintained steady. Why?

[The prepared statement of Mr. Robertson follows:]

TESTIMONY OF
GRAY ROBERTSON
PRESIDENT
HEALTHY BUILDINGS INTERNATIONAL INC.
BEFORE THE
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

MARCH 17, 1994

Introduction

I am the President of Healthy Buildings International Inc., a company that specializes in the study and assessment of indoor air quality. Since we incorporated in 1981, we have studied approximately 1,000 major buildings throughout the world. We serve our clients from five offices in England, Australia, Spain, Canada and our headquarters office located in Fairfax, Virginia.

For 13 years our activities on behalf of our clients have been devoted to the study of indoor air problems. We analyze the air for fibers of textiles, asbestos, glass and mineral wools, radon, carbon monoxide, exhaust fumes, pesticides, detergents, carpet and furniture emissions, PCBs, volatile organic chemicals, bacteria, fungi and, of course, tobacco smoke. An integral part of our investigations is the study of the ventilation systems, their design, control sequences and operational policies. These experiences are all dedicated to cleaning up the indoor environment, which makes our testimony especially relevant to any debate on these issues.

Major corporations such as IBM, GTE, Digital Equipment, Union Carbide, Pepsi Cola plus government agencies including the US Department of Health and Human Services, the Social Security Administration, Housing and Urban Development, the Federal Reserve Bank and the United Nations have all retained our services to accomplish the goal of clean indoor air. These references plus over 300 other corporate clients confirm our qualifications as experts in this field.

Some of our clients have chosen to ban smoking. A number of others prefer the practice of restricted smoking areas whereas others continue with discretionary smoking. Three different philosophies yet all have expressed satisfaction with their indoor air quality programs and the resulting quality of their indoor air. How and why? Because all adopted our primary recommendations of maximizing the capacity of their ventilation systems, of improving where necessary their filtration standards and all, because of our encouragement, have paid greater attention to correct operating practices concerning their ventilation control equipment.

My testimony today is divided into two parts. Part One concerns the techniques we use to manage smoke in the indoor environment. Part Two looks at the economic impact of HR-3434.

Part One — The Client-HBI Interface

Some clients have called us in to resolve complaints about tobacco smoke. Others have had absentee problems. Most were concerned with worker productivity. An ever increasing number of clients feared possible litigation. Now we are seeing an added influx of enquiries as a result of the Environmental Protection Agency's (EPA) risk assessment concerning environmental tobacco smoke.

Our advice to all our clients is not to lose sight of the long term objective - a comfortable and productive workplace with reductions in the concentration of all pollutants, including smoke. Fortunately, smoke, from the perspective of a ventilation engineer, is a relatively easy component of

the indoor air to manage. Microbes, with their incredible capacity to reproduce, coupled to their ability to lie dormant over long periods, are much harder to control. Furthermore, for every building where we have encountered tobacco smoke problems we have experienced tenfold that number of buildings with microbial contamination. These organisms positively cause allergies, certainly can cause infections and indisputably the secreted toxins from some are identified as potent carcinogens. Neither we, nor you, can afford to dismiss any indoor pollutants be they microbes, dusts, fibers or chemicals.

Carcinogens in the Workplace

Less than 40 percent of the 700 USA buildings that we have studied, allow smoking and this number is dropping. However, we can categorically state that the air in 100 percent of them contain substances considered by the EPA to be known or probable human carcinogens. Indeed, no less than 95 percent have been found by us to contain the class A carcinogen benzene. Others, including asbestos, radon, chloroform, trichloroethylene, carbon tetrachloride and styrene, are found throughout the buildings we study. These are present regardless of whether smoking is allowed or banned.

Without being too melancholic, perhaps I can remind you that substances thought to be carcinogens are also widespread in the food chain. Mushrooms, nuts, corn, spinach, beets, lettuce, fish and shellfish, oranges, peppers and numerous herbs and spices contain naturally occurring chemicals that have been classed as carcinogens.

Returning to the implications of the EPA's statement. First let us recognize that the EPA has no statutory authority to regulate indoor air quality. The authorized agency is the Occupational Safety and Health Administration (OSHA). This agency is currently at the formative stage of developing rules on indoor air quality, including tobacco smoke.

OSHA has for many years been charged with the responsibility of protecting workers from exposure to many chemicals including those thought to be carcinogens. They accomplish this by ensuring that airborne concentrations of carcinogens such as benzene, arsenic, asbestos, cadmium, etc., are maintained below so-called Permissible Exposure Limits (PELs). These are usually eight hour time-weighted averages. Also, the National Institute for Occupational Safety and Health (NIOSH) publishes Recommended Exposure Limits (RELs). Perhaps of most relevance, however, are the Threshold Limit Values (TLVs). Interestingly, these TLVs are specifically set to protect worker health. Furthermore, the source of many of these TLVs., the American Conference of Governmental Industrial Hygienists, state that TLVs refer to airborne concentrations of substances below which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health affects. There is as yet no TLV for tobacco smoke.

The Role of Ventilation

With respect to smoking, in the absence of a TLV, we advise prudence such that managers minimize non-smoker exposure to tobacco smoke in commercially viable ways. Certainly we stress the need for good ventilation and filtration practices whether or not smoking is allowed. Indeed, a prerequisite of any workplace that wishes to provide a comfortable and productive environment for its staff is to first ensure that generally accepted ventilation rates prevail. Specifically, for offices, restaurants, hotels, bars, etc., the ventilation rates should comply with the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 62-1989 "Ventilation for Acceptable Indoor Air Quality." In the case of offices, ASHRAE stipulates a minimum outside air ventilation rate of 20 cfm/person. This ASHRAE standard allows for a moderate amount of smoking and, when properly adopted, complaints are unusual.

Furthermore, the committee members responsible for the specification of ASHRAE 62-89 ventilation rates did not simply choose a random number for ventilation in areas of moderate smoking. Rather, their value was based on specific studies which showed 80 percent visitor acceptance at 15 cfm per person of ventilation air, with 1.1 cigarettes per hour per smoker with one-third of the population smoking (Jansen J.E., "Ventilation for Acceptable Indoor Air Quality", *ASHRAE Journal*, Oct. 1989, pp. 40-48). The use of 20 cfm of outdoor air per person for offices provides an adequate margin of comfort.

Smoking Areas

If after improving the air handling characteristics of an office building, additional actions are considered necessary, it is not unreasonable to separate smoking and non-smoking areas or to designate areas for smoking. However, it is important that such designated areas be correctly ventilated.

The smoking lounges can be designed with their own dedicated air supply and exhaust system. Or, as suggested by ASHRAE, they can be incorporated into buildings using the air supplied by the existing ventilation system. The air to the smoking lounge can be either ducted supply air or it can be "transfer air" — i.e. air deliberately induced into the lounge from adjoining areas. So long as the designated smoking areas or its dedicated smoking lounge is maintained at a negative pressure relative to adjacent areas, the laws of physics preclude any migration of smoke from the lounge to nearby areas.

Such designs are commonly practiced in many buildings. In our experience in studying hundreds of buildings, we have found nonsmokers and smokers perfectly happy with such an arrangement.

Bars and Restaurants

In the case of existing restaurants, bars, bowling alleys, etc., it is not always practical to designate specific smoking areas; nor, fortunately, is it necessary. Spatial separation, even without physical barriers, can be very effective in minimizing non-smoker exposure to ETS. Indeed, proper engineering of the ventilation systems, including the provision of correct air flows, can obviate the need for physical barriers between smoking and non-smoking areas. It is a fact of basic physics that water cannot flow up a hill. Similarly, air cannot move against a pressure gradient. If the smokers are positioned adjacent to the exhaust system of a room and the non-smokers are placed near to the supply, the air movement is inevitably from the supply grilles to the non-smoking area then on to the smoking area and from there directly to exhaust. Providing that the supply and exhaust systems are sized correctly, the smoking area will always be operating at a lower pressure than the non-smoking one, so no smoke can drift towards the non-smokers.

Proof of the efficiency of such separation has been demonstrated by others. For example, two recent papers^{1,2} report no detectable components of ETS even in air recirculated through HVAC

¹ Hayward S.B., Lui K.S., Alevantis, L., Shah K., Loiselle S., Offerman F.J., Chang Y.L., Webber L. Effectiveness of ventilation and other controls in reducing exposure to ETS in Office Buildings. Proc. Indoor Air '93, Vol 5, 509-514 (1993).

² Light, E.N., Gay, R. Preliminary assessment of designated smoking areas for nonsmoker exposure to environmental tobacco smoke. Proc. ASHRAE Conf. Indoor Air Quality '93: Operating and Maintaining Buildings for Health, Comfort and Productivity, Philadelphia, Nov. 7-10, ASHRAE Atlanta (1993).

systems from smoking areas. The first was funded by the cigarette and tobacco surtax fund of the State of California and the second was funded by the US Public Health Service Region III.

Part Two — Economic Impact of HR-3434

In the role of a businessman with a knowledge of the property management and building services industry, it would be remiss of me if I did not comment upon some of the information you have received from others, including the EPA. Specifically, Carol Browner, Administrator of the EPA, testified before this subcommittee on February 7th about the housekeeping and maintenance cost of buildings. Her testimony included the following statement:

"In addition, a substantial potential savings in housekeeping and maintenance expenses of buildings seems to be possible (as a result of a smoking ban) and could be in the \$5 to \$10 Billion range".

The phrases "seems to be possible" and "could be" were perhaps included to preserve "plausible deniability." The fact is that savings of this magnitude in housekeeping and maintenance costs are more figments of the imagination than hard data. Is this obvious hyperbole simply delivered to garner support or media attention?

Why are the savings impossible? To answer this, let us review the data used by the EPA.

Housekeeping and maintenance costs were based on assuming standard times to complete specific tasks in a hypothetical 1,000 square foot unit of building. An estimate was made of the frequency of repeating such tasks. Presumptions were made such as smoking areas needing to have their carpets vacuumed 46 percent more frequently than non-smoking areas or furniture in smoking areas needing to be dusted once every three days compared with once every five days in non-smoking areas.

Using these theoretical presumptions and the assumed standard times, comparative costs between housekeeping in smoking areas and non-smoking areas were determined. Similar calculations based on presumptions and theoretical cost savings indicated that maintenance costs in non-smoking areas could save \$122 per 1,000 square feet. To arrive at this figure, it was assumed that building owners would repaint smoking areas every six years and non-smoking areas could last 12 years!

Once having arrived at potential savings of \$105 in housekeeping and \$122 in maintenance costs per 1,000 square feet, the EPA multiplied these savings by 61 billion square feet to theorize the overall impact on the nation. They concluded that national savings would be:

Task	Theoretical Savings	Minimum Savings	Maximum Savings
Housekeeping	\$6,375,000,000	\$3,679,000,000	\$4,906,000,000
Maintenance	\$7,413,000,000	\$4,278,000,000	\$5,704,000,000
Total Savings	\$13,788,000,000	\$7,967,000,000	\$10,610,000,000

Reasonableness of these Figures.

Note that of the \$8 billion "minimum savings" projected by EPA, 31 percent is attributed to eliminating the need to clean ashtrays and 54 percent is attributable to reduced painting costs.

Can anyone really believe that by simply eliminating the emptying of ashtrays we could save over \$2.4 Billion of cleaning costs? Is it possible, that by eliminating smoking we can reduce painting costs by over \$4 Billion per year?

These sorts of calculations are a typical example of back-room voodoo economics by persons far removed from the true facts of building service costs. I personally have discussed these issues with senior management of two major property owners and two major office cleaning companies. Some of the facts that emerged from those discussions are of relevance here.

The cleaning costs for government buildings from 1986 to 1993 have climbed from less than \$1.0 per square foot to \$1.4 per square foot (Source BOMA statistics and/or Black's Guide). In the same period we have seen a steady increase in non smoking areas until we reach today's status in most government buildings where smoking is totally banned or severely restricted. Why were the cost savings for eliminating smoking not reflected in these figures. For comparative purposes, the average cleaning cost of commercial buildings in the USA through 1991/92, according to BOMA, is \$1.08 per square foot.

The EPA's estimated cost for emptying ashtrays at \$70 per 1,000 square feet represents \$0.07 per square foot. Similarly, the housekeeping cost savings were \$105 per 1,000 square feet or \$0.11 per square foot. When I asked the cleaning companies if due to the elimination of smoking I could expect a reduction in cleaning costs of between 7 and 11 cents per square foot they thought I was crazy.

They point out that a typical analysis of their overall cleaning budget of \$1.08 per square foot would be: Labor 70 cents, Insurance and taxes 11 cents, Supplies 6 cents, Supervision 5 cents, General Admin. Expenses 11 cents and Profits at 5 cents, total \$1.08. Furthermore, they point out that most of the buildings they now clean already practice restricted smoking policies. Politely, they point out that they could not pass on any significant savings whatsoever.

The savings in painting costs are also a myth. To appreciate this consider the following:

- The common areas of all major office buildings are on average, completely refurbished, including painting and re-carpeting, every four years, whether or not smoking is allowed.
- The average office lease in the USA is approximately 5 years. Thus each 5 years the offices are routinely painted, regardless of smoking policies. Larger corporations, negotiating longer leases, usually also negotiate repainting schedules with the owners, or elect to cover the costs themselves. Most paint more frequently, not less frequently, than the building owners' schedules.
- The other theoretical savings can also be shown to be figments of the imagination. Discussions with building owners or their cleaning companies revealed that:
 - Venetian blinds are rarely cleaned more than once per year.
 - Frequency of vacuuming carpets is dictated by traffic patterns, not smoking policies.
 - With 13 years of experience of studying buildings we have never observed smoking policy decisions impact on the need to revise air filter replacement schedules.

Possible Expenses Incurred by Total Smoking Bans

- Lost Productivity

A building of 100,000 square feet could typically house 600 staff allowing 167 square feet per person. Assuming these staff work 8 hours per day they collectively work 4,800 hours/day.

If 25% are smokers (150 staff), who take an average of 4 smoke breaks per day of 10 minutes duration (to leave the building, smoke a cigarette, and return to their office) then we have 150 staff x 10 mins x 4 breaks per day = 6,000 mins = 100 hours per day spent unproductively.

100 hours lost production represents 2% of the total available.

Assuming that the average worker cost \$30,000 per annum in salary plus payroll associated costs the annual payroll would be, 600 staff x \$30,000 = \$18 Million per each 100,000 sq. ft.

2% productivity losses per 100,000 sq. ft. = \$360,000.

If we then used the EPA multiplier of 61 Billion sq. ft. couldn't we now expect to lose

$\frac{61 \text{ Billion sq. ft.} \times \$360,000}{100,000} = \$219 \text{ Billion ?}$

- Energy Costs

- Elevator costs. If we return to our model building of 100,000 sq. ft. and assume that it is sub-divided into say 10 floors and further assume that the ground floor is a typical retail area, then the 150 smokers (25% of staff) would need to make 600 round trips, i.e. 1,200 extra elevator trips if they each leave the building for 4 smoke breaks per day.

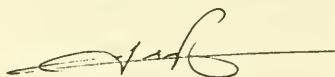
Would an EPA researcher like to project how many multi-story buildings are present in 61 Billion sq. ft. of property to project total energy consumption expended by these smokers forced outside the building?

- Door Openings. Normally an air conditioned building operates with an interior pressure slightly greater than the outdoor air - on average we expect a pressure differential of 0.02" from inside to out. If we do not keep the doors and windows closed this over pressure causes the air to spill out. Every entry or exit through the doors involves a loss of conditioned air. In theory, each door opening of say 4' x 7' (28 square feet) could lose nearly 10,000 cfm per minute if the pressure differential is 0.2".

Since our 150 smokers per 100,000 square feet of building take a total of 600 smoke breaks per day = 1,200 door openings of say 5 seconds duration each, wouldn't we be justified in working up some energy losses based on 1,200 door openings x 5 seconds each = 100 minutes at 10,000 cfm per minute multiplied by some major fraction of 61 Billion square feet?

I am not suggesting we waste time on such interesting mathematics. The fact is that there are very tangible losses in productivity and energy related losses associated with a total smoking ban once we assume that a significant percentage of those smokers affected do indeed leave the building to smoke. Furthermore, once productivity losses are included in the equation these losses dwarf the theoretical gains claimed from reduced cleaning and/or maintenance costs.

Ladies and gentleman, thank you for giving me a hearing today. What I have described is a small part of one of many presentations that our company makes for such recognized associations as the American Institute of Architects, ASHRAE, the Association of Energy Managers, the Gas Council, the Air Balance Council, the Building Owners and Managers Association and numerous Fortune 500 corporations. Without exception these groups compliment us on sharing the results of a decade of our research in this way. If, however, the tobacco industry asked us to make an identical presentation we are likely to be branded as apologists for that industry. We are not. We are an independent company with considerable expertise acquired over 13 years of studying buildings for a very diverse client base. Today I appear before you at the request and expense of the Tobacco Institute. However, I assure you that my findings, statements and recommendations are based on our own independent research. Indeed I challenge anyone to debate these issues with me and for anyone to point out where my statements depart from well accepted engineering principles and basic common-sense.



Gray Robertson
March 17, 1994

*Healthy Buildings International Inc.
10378 Democracy Lane
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Mr. WAXMAN. Thank you very much, Mr. Robertson. Mr. Pertschuck.

STATEMENT OF MARK PERTSCHUCK

Mr. PERTSCHUCK. Thank you very much. My name is Mark Pertschuck. I am co-director of the California-based Americans for Non-Smokers Rights. I'm also editor of the National Cancer Institute's Tobacco Control Monograph No. 3, which chronicles the passage of more than 600 major local tobacco control ordinances in the United States. I am here in support of H.R. 3434, as drafted and without substantive weakening amendment.

First of all, I want to thank you for introducing and shepherding this excellent legislation through the House and hopefully through the Congress. I also want to thank Phil Barnett and your superb staff for—they can speak more clearly than I can, obviously—for what they have done.

You have shown great courage in taking on this issue, courage to take up an issue against one of the most powerful campaign contributors in the history of the United States Congress. You have also taken courage in refusing to take amendments from the tobacco industry, such as amendments to preempt the groundbreaking and progressive local and State legislation which has led the way for your legislation, legislation which has passed in as disparate and varied communities as Austin, Tex., Pasadena, Calif. and Madison, Wis., to name several of hundreds of communities which have done so.

Today's panels, this one and also the previous ones, indicate, I think, what we're going to see from the tobacco industry. You will see front groups of all different sizes and compositions and they will parade before you and before your colleagues throughout this process. But the tobacco industry themselves, I mean Philip Morris and R.J. Reynolds, they will run and hide because they are afraid of non-smokers and they are afraid of you.

Finally, I would like to congratulate you on one other thing. I apologize for all the praise. You won't get it, I gather, from all of the members of this panel. By focusing on this legislation and the issue which you have also looked at of banning the advertising and promotion of tobacco products, you are focusing this debate on the key issues and the achievable issues and protecting the children of this country and the non-smokers of this country from the known deadly and maiming impact of environmental tobacco smoke.

In so doing, you help all of us, those in the tobacco control community and the rest of us around the country, in California and elsewhere, in focusing our outrage at the tobacco industry and to productive action in changing public health policy.

Thank you very much. I'm available for questions later.

Mr. WAXMAN. Thank you very much, Mr. Pertschuck. Dr. Divine.

STATEMENT OF H.A. "ANDY" DIVINE

Mr. DIVINE. Mr. Chairman, it's a pleasure to be here. My name is Andy Divine. I'm the director of the School of the Hospitality and Tourism Management at the University of Denver. My background includes more than 30 years of experience in the hospitality indus-

try, including work in consulting, private businesses and in the university setting as a professor.

My past clients have included a variety of companies and industries, such as restaurants, restaurant chains, the alcoholic beverage industry, and the tobacco industry. However, my testimony today is given on my own time and the views that I express are not on behalf of any of my clients. I wanted to testify today because I think this is an extremely important issue.

Before I begin my testimony, I would like to correct one misconception relative to the position of the National Restaurant Association on the proposed legislation. In a letter to you, sir, dated yesterday, the Association notified you of their opposition to this bill, in a letter, as I say, dated yesterday.

On behalf of the National Restaurant Association, I would like to let you know of our opposition to H.R. 3434, the Smoke Free Environmental Act. The National Restaurant Association is the largest trade organization representing all segments of the food service industry, the largest chains and the smallest independent operators, quick service and table service, dine-in and carry-out. We believe the decision on allowing smoking should be the responsibility of each individual restaurant business.

We oppose H.R. 3434 because we do not believe it is necessary or appropriate for the Federal Government to ban smoking in restaurants. While your bill would allow smoking in separately ventilated areas, this option is largely non-existent due to the high cost of such arrangements. By their very nature, restaurants are in the business of offering choices to their patrons and every effort is made to make the dining experience enjoyable.

Toward this end, many of our members have elected to ban smoking in their establishments, while most others have provided separate sections for smokers and non-smokers. The market is presently working as it should to determine individual restaurant smoking policies. No blanket government directive is needed, and this is particularly true since it is individual citizens who decide which restaurants they will visit.

They are free to choose restaurants which reflect their own tastes with regard to food, ambiance, convenience, as well as smoking policy.

We appreciate the opportunity to share our views with you on this legislation that was sent by Mr. Mark Gorman, who is the senior director of government affairs of the NRA, sir.

The roughly 600,000 restaurants in this country and the 9 million people they employ do not need further governmental intrusion into their business. History teaches us that such intrusions inevitably extract heavy prices in terms of liberty and in terms of the bottom line. That is why I must testify in opposition to this legislation.

Given the short time we have together, I will limit my comments to the three most important reasons I oppose this legislation. The first is that it's simply not necessary. Customer demand determines what the marketplace provides, and this is true in regard to smoking policy. It applies to retail establishments, restaurants and office buildings, and other commercial spaces. The public is free to choose in which type of establishments they wish to dine or conduct other

business and whether or not smoking is allowed is one consideration they keep in mind.

Years ago, there was little demand for smoke-free restaurants and you probably would have had trouble finding one. Today they are common. Presumably, those who wish to avoid exposure to secondhand smoke patronize smoke-free restaurants and other establishments. Those who either smoke or don't particularly care one way or the other patronize restaurants with accommodations for smokers and non-smokers.

Thus, the marketplace has worked to meet the changing demands placed upon it. Almost all the polls that I have seen on the subject indicate people do not favor banning smoking in public. Rather, they generally favor designated areas and think that they work.

Second, given all the demands of the Federal Government and the ever-increasing Federal deficit, it is worth asking why should this be of Federal concern at all. As I've already noted, smoking policy should be determined by business owners and managers based on marketplace demand. They don't even have to be a matter of local or State jurisdiction.

In any case, Washington faces a great many more pressing issues and the creation of legislation which seems to inevitably increase the bureaucracy and may further burden an already overloaded civil court system may not be desirable. Third, this legislation would do serious damage to both liberty and economy. This ban on smoking in public clearly represents a loss of individual liberty. That is clear on its face.

Even when testimony from proponents of the bill indicates that reasonableness of the smokers in accommodating non-smokers, some may find the financial business impact to be less clear. In terms of the protection of the 45 million adult smokers and their rights, I think that it was clear by the evidence given this morning that we have accommodations and possible accommodations to handle that.

I thank you very much for this opportunity.

[The prepared statement of Mr. Divine follows:]

STATEMENT OF H.A. "ANDY" DIVINE

Mr. Chairman, it's a pleasure to be with you today.

My name is Dr. Andy Divine. I am director of the School of Hospitality and Tourism Management at the University of Denver. My background includes more than 30 years' experience in the hospitality industry, including work in consulting, private business, and the university setting.

My past clients have included a variety of companies and industries such as restaurants, restaurant chains, the alcoholic beverage industry, and the tobacco industry. However, my testimony today is given on my own time, and the views I express are not on behalf of any client. I wanted to testify today because I feel this issue is extremely important.

The roughly 600,000 restaurants in this country, and the 9 million people they employ, do not need further governmental intrusion into their businesses. History teaches us that such intrusions inevitably extract heavy prices in terms of liberty and in terms of the bottom line. That is why I must testify in opposition to this legislation.

Given the short time we have together, I will limit my comments to the three most important reasons I oppose this legislation. The first is that it is simply not necessary.

Customer demand determines what the marketplace provides. This is true in regard to smoking policies, and it applies to retail establishments, restaurants, office

buildings, and other commercial spaces. The public is free to choose in which type of establishments they wish to dine, or conduct other business. and whether or not smoking is allowed is one consideration they may keep in mind.

Years ago, there was little demand for smoke-free restaurants and you probably would have had trouble finding one. Today, they are common. Presumably, those who wish to avoid exposure to secondhand smoke patronize smoke-free establishments. Those who either smoke or don't particularly care one way or the other patronize restaurants with accommodations for smokers and nonsmokers.

Thus, the marketplace has worked to meet the changing demands placed upon it. Almost all of the polls I have seen on this subject indicate people do not favor banning smoking in public. Rather, people generally favor designated areas, and think they work.

Second, given all the demands on the Federal Government and the ever-increasing Federal deficit, it is worth asking why this should be a Federal concern at all? As I've already noted, smoking policies should be determined by business owners and managers, based on marketplace demand. Failing that, they ought to be a matter of local or State jurisdiction. In any case, Washington faces a great many more pressing issues.

Third, this legislation would do serious damage to both our liberty and the economy. This "ban" on smoking in public clearly represents a loss of individual liberty. That is clear on its face. Some may find the potential business impact to be less clear.

Still, any time you give 45 million adult American smokers another reason not to patronize your business, you will feel the effects. Period. They may vary for different kinds of restaurants in different markets, but the effects will be felt.

Consider, also, what is probably the most compelling evidence we have that smoking bans will cost restaurants business. It is right before our eyes.

Some chains—notably McDonald's, Arby's, and Taco Bell—have banned smoking in their company-owned restaurants. Generally speaking, restaurants which ban smoking claim they will suffer no loss in business, or a negligible loss. Some claim they may even see an increase in business.

Nevertheless, having banned smoking, they are now supporting this legislation, pleading with government to force their competition to do what they have already done voluntarily themselves. Why? For the obvious reason that they fear they may lose business if their competitors continue to allow smoking.

The best route, again, is to simply let the marketplace function. However, those restaurants which have joined the anti-smoking parade are taking just the opposite approach. Having taken an extreme position themselves—with potentially serious ramifications for their businesses—they ask government to impose it on others. How convenient it must be to be able to "place a bet", and then have the luxury of asking Uncle Sam to cover it for you!

Mr. Chairman, it is with all due respect that I must oppose the legislation before you. I urge you, and the rest of our society, to find another way to resolve conflicts between smokers and nonsmokers. A way which allows people to continue to exercise freedom of choice. A way which respects the rights of us all. And a way which allows businesses to meet the needs of their customers without further interference from Washington.

Thank you.

Mr. WAXMAN. Thank you, Mr. Divine. Ms. Perske.

STATEMENT OF MARTHA PERSKE

Ms. PERSKE. Mr. Chairman, my name is Martha Perske. I live in Darien, Conn. As a private citizen, I have been studying the environmental tobacco smoke issue for the past 3 years. I work independently and receive no funding. I represent neither industry nor government. If there is a group I represent, it's the 50 million smokers across the Nation.

I do have to respond to Mr. Banzhaf's comment when he ridiculed our march on Washington last September. He said there were 45 adults, a number of children and 3 dogs. Well, I want you to know that two of those dogs were mine. We had a great reception. I was surprised, but we had cars honking at us, people giving the thumbs-up, applauding us, people taking pictures of us, and

even the Washington Post wrote an upbeat article about us finally, saying that in a place that was used to such demonstrations, that ours was very well received. So I just have to comment on that.

I am a professional illustrator. Among other things, I illustrated two major reports to Presidents Nixon and Carter and designed the commemorative postage stamp in honor of the International Year of Disabled Persons. I have put my career on hold in order to work full-time and at my own expense on this issue.

I did this, in part, because I felt that the public was being seriously misled about the environmental tobacco smoke issue. I wanted to learn more and it turned into a full-time job. I find it disturbing that scientific data that are "inconclusive" magically turn into "conclusive" when presented to the public. After reviewing the data on asthma, the Science Advisory Board concluded in its report that there wasn't enough evidence to state that environmental tobacco smoke causes asthma.

At a hearing before your subcommittee last year, the chairman of the Science Advisory Board Panel repeated that conclusion and said that further research is needed. This information isn't getting to the public. This isn't what the public hears. The public hears that ETS causes asthma. For instance, in the American Medical Association's Annual Tobacco Update, it makes no mention of the Science Advisory Board's conclusion. Instead, it states, quite unequivocally, that ETS is the cause of up to 26,000 new cases of asthma.

The AMA based this claim on the EPA report, which says that "Eight thousand to 26,000 is a probable range of new asthma cases per year that are attributable to ETS exposure from mothers who smoke at least 10 cigarettes per day." EPA made this surprising claim after stating that the evidence was inconclusive and admitted that the confidence in this 8,000 to 26,000 range is medium and is "dependent on the conclusion that ETS is a risk factor for asthma induction."

AMA is not the only one who is misrepresenting the data. Based on the EPA report, the following are also making the same misleading claims about ETS and childhood asthma. The National Cancer Institute says "ETS exposure increases the number of new cases of asthma in children who have not previously exhibited symptoms."

Dr. Alfred Munser, president of the American Lung Association, in public testimony, said "Eight thousand to 26,000 cases of childhood asthma per year are attributable to environmental tobacco smoke." The American Heart Association, in its 1994 report, says "Mothers who smoke 10 or more cigarettes a day can cause as many as 26,000 new cases of asthma among their children each year."

Not once did any of these groups or individuals mention the Science Advisory Board's conclusion. I worry about the process of public education and what happens to it when powerful individuals or groups decide what we will or will not see.

Thank you for letting me speak.

[The prepared statement and attachments of Ms. Perske follow:]

TESTIMONY OF
MARTHA PERSKE - DARIEN, CONNECTICUT
PRIVATE CITIZEN

BEFORE THE
SUBCOMMITTEE ON HEALTH AND THE ENVIRONMENT
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES

MARCH 17, 1994

Mr. Chairman, Members of the Subcommittee:

My name is Martha Perske. I live in Darien, Connecticut. As a private citizen, I have been studying the environmental tobacco smoke (ETS) issue for the past three years. I work independently and receive no funding. I represent neither industry nor government. If there is a group I represent, it's the 50 million smokers in the United States.

I am a professional illustrator. Among other things, I illustrated two major reports to Presidents Nixon and Carter, and designed the commemorative postage stamp in honor of the International Year of Disabled Persons.

I have put my career on hold in order to work full time and at my own expense on this issue. I did this because I felt that the public was being seriously misled about the ETS issue. I wanted to learn more, and it turned into a full time job.

I find it disturbing that scientific data that are "inconclusive" magically turn into "conclusive" when presented to the public.

Here's what I saw happen in the case of ETS and childhood asthma.

After reviewing the data on asthma, the Science Advisory Board concluded in its report that there wasn't enough evidence to claim that ETS causes new cases of asthma.¹ At a hearing before your subcommittee last year,

¹ Science Advisory Board Report, "An SAB Report: Review of Draft Passive Smoking Health Effects Document," November 1992, p. 5.

Perske 2

the Chairman of the Science Advisory Board panel repeated that conclusion, and said that further research is needed.²

This information is being stifled. Contrary to what the Science Advisory Board concluded, the public is being told otherwise. For instance, in the American Medical Association's (AMA) "Annual Tobacco Update," it makes no mention of the Science Advisory Board's conclusion. Instead, it states unequivocally that "...[ETS] is the cause of up to 26,000 new cases of asthma..."³

The AMA based this claim on the EPA report which says that "8,000 to 26,000 is a probable range of new [asthma] cases per year that are attributable to ETS exposure from mothers who smoke at least 10 cigarettes per day."⁴ (EPA made this surprising claim after stating that the evidence was inconclusive, and admitted that the confidence in the 8,000 to 26,000 range is "medium" and is "dependent on the conclusion that ETS is a risk factor for asthma induction.")

Even more disturbing is that it's not just the AMA who is misrepresenting the data. Based on the EPA report, the following are also making the same misleading claims about ETS and childhood asthma:

The National Cancer Institute, in its "Cancer Facts."⁵

Dr. Alfred Munzer, President of the American Lung Association, in public testimony.⁶

The American Heart Association, in its 1994 report.⁷

Not once did any of these groups or individuals mention the Science Advisory Board's conclusion in their published material. Not once did they

² "Environmental Tobacco Smoke," Hearing before the Subcommittee on Health and the Environment of the Committee on Energy and Commerce, House of Representatives, July 21, 1993. Transcript pp. 135, 136.

³ American Medical Association "Annual Tobacco Update" presented by Lonnie R. Bristow, MD., to the House of Delegates in December 1993, p. 1.

⁴ EPA Report, Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders," December 1992, p. 8-15.

⁵ "Cancer Facts," National Cancer Institute-National Institutes of Health, 6-14-93, p. 4.

⁶ Testimony of Alfred Munzer, M.D., on behalf of The Coalition on Smoking OR Health, to the House Committee on Agriculture, Subcommittee on Specialty Crops and Natural Resources, July 21, 1993, p. 4.

⁷ Heart and Stroke Facts: 1994 Statistical Supplement, American Heart Association, p. 16.

Perske 3

mention the uncertainty of the EPA's claim, or that it was based on inconclusive evidence.

The Majority Staff of your Subcommittee are disseminating their own "ETS Facts," in which they also state that ETS may cause thousands of new cases of childhood asthma each year. Like the others, the Majority Staff chose to omit the conclusion of the Science Advisory Board. Why? Is there some reason why we shouldn't know about this? What happens to the public education process when powerful individuals or groups decide what we will or will not know?

Thank you for letting me speak.

Attached: "Asthma, Environmental Tobacco Smoke, Kids, and Ambiguities"

"Reply" published in *The Journal of Pediatrics*, July 1993, in which Dr. Thomas A.E. Platts-Mills refers to EPA's vagueness on the subject of asthma. He disagrees with the EPA and questions the derivation of some of its claims.

ASTHMA, ENVIRONMENTAL TOBACCO SMOKE, KIDS, AND AMBIGUITIES

The EPA report¹ says that the evidence is "suggestive" but not "conclusive" that ETS causes asthma in kids:

"It was further concluded that ETS is a risk factor for new cases among previously asymptomatic children, since the evidence is suggestive, but not conclusive, of a causal association..." (p. 8-10)

In other words, there is insufficient evidence that ETS causes asthma. Then without explanation, EPA jumps from "suggestive" to "conclusive:"

*"This report concludes that, **in addition to inducing new cases of asthma**, ETS exposure increases the number and severity of episodes..." (emphasis added) (p. 8-15)*

Next, even though there are insufficient data to say that ETS causes new cases of asthma, EPA produces theoretical numbers:

"For new cases of asthma in previously asymptomatic children under 18 years of age, we estimate that 8,000 to 26,000 is a probable range of new cases per year that are attributable to ETS exposure from mothers who smoke at least 10 cigarettes per day. The confidence in this range is [only] medium and is dependent on the conclusion that ETS is a risk factor for asthma induction." (p. 8-15)

The 8,000-26,000 figures are disseminated to the public as fact. For instance, in its "Heart and Stroke Facts: 1994 Statistical Supplement," the American Heart Association states: "Mothers who smoke 10 or more cigarettes a day can cause as many as 26,000 new cases of asthma among their children each year."

EPA's Science Advisory Board Report concludes that there is "insufficient evidence for causality for asthma induction or SIDS." (SAB Report,

¹ Environmental Protection Agency Report, "Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders," EPA/600/6-90/006F.

Perske 2

November 1992, p. 5)

The EPA Report was formally released in January of 1993. Here's what followed:

JULY 21, 1993: Morton Lippmann, Chairman of EPA's Science Advisory Board panel told Representative Waxman's subcommittee that the data were "insufficient" to claim that ETS causes asthma and said further research is needed:

"...the [SAB] committee agreed with EPA that the data were insufficient to come to firm conclusions [that ETS causes] induction of asthma in previously asymptomatic children... Further research is needed to determine if a causal link with [asthma] can be established." ²

(Lippmann also told Waxman's subcommittee that the data were insufficient to conclude that ETS causes increased rates of heart disease deaths in adults, upper respiratory tract infections, and increased risk of Sudden Infant Death Syndrome [SIDS].)

JANUARY 25, 1994: EPA Administrator Carol Browner writes a letter to Ann Landers, telling her readers "not to smoke in front of children" because, among other things, ETS "causes children to develop asthma."³

EPA apparently ignored its risk assessment office in Cincinnati, which cautioned EPA that any asthma risk from ETS must NOT (their emphasis) be portrayed as a public health risk to the general non-predisposed population. In fact, the Cincinnati office said there was insufficient evidence that ETS is a Group A human carcinogen. (Written comments submitted to EPA, March 24, 1992, Office of Environmental Criteria and Assessment, EPA, Cincinnati)

If ETS causes asthma in kids, as the EPA report says, why, in one major

²"Environmental Tobacco Smoke," Hearing before the House Subcommittee on Health and the Environment, July 21, 1993, Henry Waxman, Chairman, pp. 135, 136.

³ *Daily News*, Los Angeles, CA., January 25, 1994.

Perske 3

study reviewed by EPA (Martinez et al., 1991b), was there an increased risk only when the mothers had 12 or fewer years of formal education? Here's what the EPA report said about this study:

Children whose mothers had 12 or fewer years of formal education and smoked 10 or more cigarettes per day had an increased risk for developing asthma. However, the increased risk disappeared if the mothers had more than 12 years of formal education. (p. 7-50)

EPA gives no explanation as to why there was no effect from ETS exposure among children whose mothers smoked 10 or more cigarettes a day and had more than 12 years of formal education.

EPA had this to say about the three remaining major studies on asthma:

Weitzman et al., 1990: An increased risk for children whose mothers smoked 10 or more cigarettes per day. No information was available on parental respiratory symptoms or socioeconomic status. The results of this study could be explained partially by overreporting of asthma by smoking mothers. (p. 7-49)

Burchfield et al., 1986: An increased risk for males with two smoking parents, but not for girls or for children with one parental smoker. (p. 8-10) Reporting bias and diagnostic bias may in part explain the relationships reported in this study; smoking parents may be more likely to report asthma in their children, and physicians may be more prone to diagnose asthma in children of smoking parents. (p. 7-44)

Sherman et al., 1990: Did not find an effect, but made no effort to assess the effect of heavy smoking by parents, nor was there control for socioeconomic status. (p. 8-10)

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EPA IGNORES SCIENCE ADVISORY BOARD PANELISTS

The EPA report says: "In summary, there are no single or combined confounding factors that can explain the observed respiratory effects of passive smoking in children." 8-2

NOT SO, SAYS SCIENCE ADVISORY BOARD PANELIST DR.

JAMES E. WOODS, JR.: "...on the comment about that no single or combined confounding factor explains the observed respiratory effects, I'm not sure that they have been studied to the point that you can say that with certainty at this point. So there's going to have to be some kind of hedging with regard to the confounders I think even more so." Transcript p. II-132. *

NOT SO, SAYS SCIENCE ADVISORY BOARD PANELIST DR.

HOWARD ROCKETTE: "I guess I had some concerns, as was mentioned before, over some of the way the confounding was discussed, particularly on page 8.2. You have 'In summary, there is no single or combined confounding factors which explain the observed respiratory effects of passive smoking in children.' ...I see nothing there that rules those out. That's almost a nonsequitur to have that implying the confounding factors away." Transcript p. II-127. "To rule it out is a rather strong statement." Transcript p. II-128. *

The EPA report says:

"Other indoor air pollutants (wood smoke, NO₂, formaldehyde, etc.) have not been found to explain the effects of ETS..." 8-1

SCIENCE ADVISORY BOARD PANELIST DR. MICHAEL D.

LEBOWITZ says "sometimes the effect of ETS has disappeared when considering effects of other exposure" (i.e., NO₂, wood-coal smoke, etc.) (Written comments submitted to EPA, July, 1992)

The above comments from Science Advisory Board panelists Woods, Rockette, and Lebowitz were made after reviewing asthma data in EPA's revised draft. EPA had a chance to modify its statements before releasing its final report, but didn't.

* Transcript from the EPA-Science Advisory Board meeting, July 21, 22, 1992.

The Journal of Pediatrics 1993 Jul
Volume 123, Number 1

Reply

To the Editor:

Dr. Moyer correctly draws attention to the issue of environmental tobacco smoke (ETS), which has been shown to be related to respiratory infections in infants.¹ However, we are not convinced that ETS is "an equally important risk factor for the development of asthma." In our study of inner city children in Atlanta, 19 of 37 children with asthma and 19 of 36 control children gave a history of passive smoke exposure.² Similarly, among young adults in Wilmington, Del., we found no correlation between active or passive smoking and acute asthma.³ Duff et al.⁴ found that a significant proportion of children less than 2 years of age coming to an emergency department with acute wheezing had elevated salivary cotinine levels but that this was not true of wheezing children more than 2 years of age. The studies quoted by Dr. Moyer include a report from Weitzman et al., who concluded that ETS is a risk factor for asthma among children less than 5 years of age; however, neither that nor the other articles provided evidence about children more than 5 years of age. Furthermore, the recent Environmental Protection Agency report on ETS appears vague on the subject: on page 14 they estimated that "ETS exposure exacerbates symptoms in 20% and is a major aggravating factor in approximately 10% of asthmatic children." The derivation of these percentages is not clear.

Our data do not support a major role of ETS in causing asthma in children more than 5 years of age, and we are not convinced by the published data from other groups that active or passive smoking is an important risk factor for acute exacerbations of asthma in this group.

Thomas A. E. Platts-Mills, MD, PhD

Robert S. Call, MD

Division of Allergy/Clinical Immunology

University of Virginia

Charlottesville, VA 22908

9/35/46936

REFERENCES

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2. Call RS, Smith TF, Morris E, Chapman MD, Platts-Mills TAE. Risk factors for asthma in inner city children. *J PEDIATR* 1992;121:862-6.
3. Gelber L, et al. Sensitization and exposure to indoor allergens as risk factors for asthma among patients presenting to hospital. *Am Rev Respir Dis* (in press)
4. Duff AL, Pomeranz ES, Gelber LE, et al. Risk factors for acute wheezing in infants and children: viruses, passive smoke, and IgE antibodies to inhalant allergens. *Pediatrics* (in press).

Mr. WAXMAN. Thank you for your testimony. Dr. Maves, we've heard today a lot of testimony about some of the health aspects of ETS, especially cancer, heart disease, asthma and respiratory infections. You represent the ear, nose and throat specialists and one of the most significant and often most neglected adverse health effects is its effect on the ears and ear infections.

Can you explain what environmental tobacco smoke does to the ears and how serious this problem might be?

Mr. MAVES. Thank you. This is a very serious problem. The tobacco smoke, particularly the particulate matter and the irritating effects of that particulate matter, can cause asthmatic children to ventilate through their nose and also ventilation of the ear. There's a small tube that goes from the back of the nose to the middle ear which provides ventilation in these children. With irritation from tobacco smoke, that tube can be cut off and so the child will not have adequate ventilation of the ear.

As a result, fluid builds up, and this is a problem because this causes a hearing loss. This is of particular concern to us simply because these children, particularly children of 1, 2, 3 years of age, which are the most likely to get this problem anyway, are at a risk for language development, for learning development. It hits them at a particularly critical time in their life.

This is a problem that is one that our membership deals with frequently, that physicians who treat these children have to do quite commonly. Removing tobacco smoke as an environmental hazard would lessen the impact of this problem on children and so obviously lessen the number of cases that we see of children with middle ear infusions.

Mr. WAXMAN. What are the medical consequences of children with these middle ear infections?

Mr. MAVES. A child who gets a middle ear infection obviously will have a problem where they may need some antibiotics. They may well require decongestants. If medical therapy fails, and it does so in about 25 to 30 percent of these children, they will then need to have tympanostomy tubes. These are little small tubes that are put in the eardrums of children.

So as we're talking about health care reform and, if you will, the cost of medicine, this is one thing we can do to lessen the impact of this particular environmental hazard on these children, and, if you will, indirectly impact the cost of medicine for us all.

Mr. WAXMAN. At one time I had heard some discussion that frequent infections in the middle ear could cause learning disabilities. Do you have any information on that?

Mr. MAVES. Yes, sir, it can. You just need to realize that a child learns by imitation. Language development is a very delicate process that begins with the child imitating his mother as a newborn and then eventually hopefully culminates in that child acquiring language at an age of 3 to 5 years so that they're ready to enter school.

Children that have difficulties hearing, be that from middle ear infections, be that a deafness that occurs as a result of either hereditary conditions or metabolic conditions, will slow down that child's process of learning at the most critical time in their entire life.

Mr. WAXMAN. Are language processing problems in any way related?

Mr. MAVES. I don't have any information on that. I don't believe that is linked in any way to this particular problem. No, sir.

Mr. WAXMAN. Mr. Eisenberg, the tobacco industry witnesses argue that better ventilation is a more effective response to reducing health risks from tobacco smoke. Apparently, you don't agree and have testified that environmental tobacco smoke cannot be totally removed from indoor air except by removing the smoking itself.

You've noted that most ventilation systems in public and commercial spaces recirculate much of the contaminated indoor air. Isn't a prohibition on smoking or the restriction of smoking to areas that are separately ventilated the most effective way to minimize the health risks of ETS?

Mr. EISENBERG. We believe that to be the case. The problem is you can engineer just about anything. You can engineer systems to reduce the hazards from smoke. You can't get rid of it. The more you engineer, the higher the cost. You can engineer moon travel, but most of us don't travel to the moon.

The testimony that I think is in most opposition to us on this panel emphasizes comfort, not health and how people feel about the environment. Whether they can feel the health hazard doesn't seem to be material here. What is material in this testimony is comfort. We think health has got to be material to this and when you're dealing with the existing standards and the fact that you cannot get rid of all the smoke, you are still left with a health problem.

Again, to reemphasize something that we said before, since this is such a significant indoor pollutant and, at the same time, is one where you know the source, it's also the easiest to get rid of. You just don't allow it or you separately ventilate it. That's all there is to it.

Mr. WAXMAN. Thank you very much. Mr. Pallone, do you have something?

Mr. PALLONE. No.

Mr. WAXMAN. I want to thank you all very much for your participation in this hearing today. Thank you for being with us. That concludes the hearing today and we stand adjourned.

[Whereupon, at 2:43 p.m., the hearing was adjourned.]

[The following statements and letters were submitted for the record:]



American Academy of Otolaryngology—Head and Neck Surgery, Inc.

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JEROME C. GOLDSTEIN, MD
EXECUTIVE VICE PRESIDENT

March 15, 1994

The Honorable J. Dennis Hastert
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Hastert:

We are writing to urge you to vote yes on H.R. 3434, "The Smoke Free Environment Act of 1993," during the bill's mark-up on March 21, 1994 in the Committee on Energy and Commerce. The bill, sponsored by Congressman Henry Waxman, would make all public places throughout the United States, smoke-free, unless a separate smoking area with a separate ventilation system is provided.

The American Academy of Otolaryngology-Head and Neck Surgery is the world's largest organization of physicians dedicated to the care and treatment of diseases and disorders of the ears, nose, throat, and related structures of the head and neck. Many of our members care for patients with medical disorders which are a direct result of or have been aggravated by exposure to secondhand smoke, including asthma, allergies, chronic bronchitis, hearing loss, pneumonia, and cancer. We are enclosing with this letter, a copy of our video, "Poisoning Your Children: The Perils of Secondhand Smoke," which highlights the impact of secondhand smoke on children's health and development.

The business community has already expressed its support for H.R. 3434. The National Council of Chain Restaurants (including Dunkin' Donuts and Hardee's), and the Building Owners and Managers Association have both voiced their endorsement of the legislation. McDonald's is not only supporting the bill, but is making all of its 1,400 company-owned restaurants smoke-free.

In light of all this, the Surgeon General's warnings, and the Environmental Protection Agency's recommendation that "every company have a smoking policy that effectively protects nonsmokers from involuntary exposure to tobacco smoke," we urge you to vote yes on H.R. 3434, and help protect the health of nonsmokers, especially children, for whom clean air is essential to their health growth and development.

Sincerely,

Joan Lunden
Joan Lunden
National Spokesperson

Jerome C. Goldstein
Jerome C. Goldstein, MD
Executive Vice President

Nancy Snyderman
Nancy Snyderman, MD
Coordinator for Governmental Affairs

Revised Page 2

Annual Meeting: September 18 - 21, 1994, San Diego, CA

TOTAL P. 22

Statement of the American Hotel & Motel Association

The American Hotel & Motel Association is a federation of associations representing lodging's interests in the fifty states, the District of Columbia, Puerto Rico and the Virgin Islands. The Association federation has a membership in excess of 10,000 individual lodging properties which represents approximately 1,300,000 rooms and 1,500,000 jobs. On behalf of the lodging industry we wish to express our concern about HR 3434, the "Smoke-Free Environment Act of 1993."

The lodging industry has long been in the vanguard of responding to the evolving wants of our guests for non-smoking accommodations. Voluntarily we have provided and continually increased our percentage of non-smoking rooms in response to guest preference. Also, we have willingly designated non-smoking areas in restaurants and are prepared to continue to modify and adapt our non-smoking policies in response to changing public demand. We believe this market-oriented response to guest needs is the correct way to deal with the smoking issue. A recent USA TODAY/CNN/Gallup survey, reported in the March 16 USA TODAY, reflects a similar view. The majority of those polled believed that non-smoking areas should be set aside as opposed to having a total ban imposed. The poll also showed that the percentage of those calling for an outright ban in hotels was substantially less than those seeking bans in other environments.

We believe the above statistics reflect the fact that hotels are unique in one particular facet of our public dealings. We are quite figuratively and literally a traveler's "home away from home." In our sleeping rooms and, to a lesser extent, in our meeting rooms there is a de facto conversion of a public area to a private area. When we "rent" a meeting room to a group, whether as part of a large convention or single meeting, they expect to exercise a large degree of control over the activities that take place in those spaces. Those areas are no longer public in the commonly accepted usage, and no one disputes the right of a group conducting a meeting to exclude the general public from its meeting room. The right of those conducting their private meeting to determine whether or not they will have a smoking meeting would be lost and seemingly the hotel would have the responsibility to insinuate itself into private meetings to ensure compliance with the law. More and more attendees at meetings are voluntarily choosing to make them non-smoking. They should continue to have that right.

This idea of privacy is nowhere more evident than in an individual's sleeping room. The guest expects an environment that closely resembles home. Hotels strive to create that "home away from home" environment, but HR 3434 would deny that right. The idea that a guest in his or her room for up to 12 hours in a day should be forbidden the right to smoke by the federal government and that the hotel should police guest activity is unreasonable. To hold out the possibility of imposing fines of up to \$5,000 for failure to enforce an unenforceable law is disingenuous.

As one of the key components of the hospitality industry, and the host to millions of foreign visitors a year, the hotel industry is aware that there are widely held views on smoking in the world and that foreign visitors are often more likely to be smokers. A blanket federal mandate, beyond giving the wrong signal to our foreign guests, is again likely to be unenforceable.

Efforts to address smoking issues from a legislative or regulatory perspective are underway in many states. Of particular interest are the efforts in California which have sought a reasonable balance between the concerns of smokers and non-smokers and have refrained from putting commercial establishments such as hotels in the middle of a no win situation by making them active enforcers of public policy. While we believe that the best approach is one that lets the demands of the public shape the status of smoking facilities, we do not condemn a reasonable approach by local governments to balance differing views.

Unfortunately, we can not agree with a heavy-handed, unenforceable, blanket federal ban on all smoking that leaves hotels, among others, to be its enforcers under pain of staggering fines.

We commend this Committee for its commitment to preserving the health of our citizens but call on it to eliminate any further consideration of HR 3434 in its present form.



HOVENHARTS OFFICE 1415 WILSHIRE BOULEVARD • SUITE 2006 BEVERLY HILLS • LOS ANGELES CA 90024
TEL 310 206 • 400-794-4422 • FAX 310 204 1622

March 15, 1994

The Honorable Henry A. Waxman
Chairman, Subcommittee on Health and the Environment
Committee on Energy and Commerce
512 House Annex 1
300 New Jersey Avenue, SE
Washington, D.C. 20515

Subject: HR 3434

Dear Congressman Waxman:

The Board of Directors of the California Restaurant Association at its meeting held March 8, 1994 adopted a resolution to support HR 3434, your bill to regulate smoking in public facilities throughout the United States.

Our endorsement of HR 3434 is consistent with the position adopted by the California Restaurant Association in June 1990 to support the establishment of laws directing the regulation of smoking when such laws regulate smoking in all public places throughout the State of California without exclusion or exception. Although our Board has taken no position relative to the health effects of second hand smoke, it is clear that local jurisdictions in California have done so and have created a network of inconsistent laws throughout the state thereby creating uneven and noncompetitive situations. We also believe that if second hand smoke is a health hazard, it is a hazard for employees as well as customers and regardless of geography. These concerns led to the adoption of our position in 1990 and continues to provide a solid basis for even-handed regulation nationwide.

Sincerely,

Stanley R. Kyler, CAE
Executive Vice President

c: John Dingell
Carlos Moorhead



Health Insurance Association of America

Bill Gradison
President

March 15, 1994

The Honorable Henry Waxman
Chairman
Subcommittee on Health and
the Environment
2415 Rayburn HOB
Washington, D.C. 20515

Dear Mr. Chairman:

I am pleased to inform you of the action of the Board of Directors of the Health Insurance Association of America on February 23 endorsing the Smoke-Free Environment Act. This was on unanimous recommendation of the Committee for Corporate Public Involvement of our industry.

This legislation is in keeping with past policy statements of the HIAA on tobacco use and the leadership of our industry since the 1970's on the health dangers of smoking.

I hope this will prove helpful in the consideration of this legislation by your Subcommittee.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bill Gradison", is written over a light-colored background.

4025 Fair Ridge Drive Fairfax, VA 22033-2868

Telephone: 703-273-0911
FAX: 703-273-9363
ICHELFS: LAFCHO

March 17, 1994

The International Association of Fire Chiefs (IAFC) represents approximately 10,000 Fire Chiefs and senior fire officers. Since 1873 the IAFC has been a respected leader on fire protection issues. It goes without saying that all fire agencies in America and around the world share a common mission and purpose: to save lives, prevent injuries and reduce property losses from fire.

Your committee is meeting today to weigh the worthiness of the Smoke-Free Environment Act of 1993. The IAFC salutes the bravery and resolution of Chairman Waxman and his colleagues for their introducing a bill which will benefit the health and life-safety of all citizens, not just from reducing the chronic deadly hazards of environmental tobacco smoke (ETS), but, as a side benefit of this legislation, from the equally deadly traumatic effects of fires caused by lighted tobacco products and their tools of ignition (matches and lighters).

There is an old expression that aptly applies here: "Where there is smoke, there is fire." That can be extrapolated to also mean: Where there are smokers, there will be fires. This has been well documented.

That is why fire service organizations, such as the IAFC, support this landmark legislation. It is not just a smoke issue, it is also a fire issue.

ETS may have only recently been proven to be deadly, but fires have been killing for much longer. Fire most often kills the very young and the older citizens in our society because of their inability's to escape.

IAFC: Smoke-Free Environment Act of 1993**Page 2**

The grim statistics provided this committee by our esteemed associates at the National Fire Protection Association (NFPA) provide graphic testimony that clearly points out the connection between lighted tobacco products and fire related death, injuries and property losses.

In the interests of time we will conclude our testimony by stating that the IAFC has read and concurs with the submitted testimony of the NFPA in regards to this burning issue.

Thank you for asking our organization to offer its professional opinion on this important matter.

Respectfully submitted,

A handwritten signature in black ink that reads "Doug Brown". The signature is fluid and cursive, with a long horizontal line extending from the end of the name.

**Doug Brown, Director
Government Relations Team**

MAILED TO HOUSE ENERGY AND COMMERCE REPUBLICAN MEMBERS

*James O. Mason, M.D.
474 West Quail Run Drive
Farmington, Utah 84025*

March 15, 1994

The Honorable XXX
U.S. House of Representatives
Washington, D.C. 20515

Dear Representative XXX:

As a fellow friend and Republican, I wish to express my support for a desperately needed public health initiative before the House Energy and Commerce Committee. If enacted, this measure would protect all Americans from the dangers of environmental tobacco smoke exposure, and vastly improve the state of health and safety in all public places in this country.

Entitled the Smokefree Environment Act of 1994 (H.R. 3434), this bill would prohibit smoking in all public entities in which 10 or more persons enter in the course of a week. A nonsmoking policy would have to be adopted or smoking would be permitted in separately ventilated rooms not commonly used by nonsmokers. Under H.R. 3434, up to 9,000 lung cancer and 40,000 heart disease and stroke deaths in nonsmokers would be prevented annually. 150,000 to 300,000 lower respiratory tract infections in infants and children, and their resulting 7,500 to 15,000 hospitalizations would be prevented annually.

Improving the quality of health care is the primary topic for debate in this country. Reducing health care expenditures, while preventing disease are major components of this discussion on "either side of the aisle." Under H.R. 3434, medical cost savings for nonsmokers would fall between \$1.5 billion and \$3.0 billion per year, and between \$5 billion and \$15 billion for smokers. More importantly, H.R. 3434 would reduce nonsmoking mortality by as much as 49,000 deaths per year. Smoking mortality would be reduced by as little as 33,000 deaths and as much as 99,000 deaths annually under this comprehensive nonsmoking policy.

Last month six U.S. Surgeon Generals -- four of whom served under Republican Administrations -- endorsed the Smokefree Environment initiative before the House Energy and Commerce Subcommittee on Health and Environment. As a former Assistant Secretary for Health and a member of the medical profession, I wish to reaffirm their call for federal leadership and action in this area. H.R. 3434, which has almost 60 cosponsors deserves your full support. If we are truly serious about improving the status of health in this country, particularly for our young people, then it is incumbent upon you and Congress to take the first step toward ensuring public protection from the dangers of exposure to passive smoke.

I urge you to support H.R. 3434.

Sincerely,

James O. Mason

James O. Mason, M.D.
Former Assistant Secretary for Health
Bush Administration

TESTIMONY OF TERRIE M. DORT
EXECUTIVE DIRECTOR
NATIONAL COUNCIL OF CHAIN RESTAURANTS

The National Council of Chain Restaurants applauds Congressman Henry Waxman for introducing the Smoke-Free Environment Act of 1993. We are proud to endorse this legislation as a fair and comprehensive resolution to the issue of smoking in places of public accommodation.

The National Council of Chain Restaurants represents most of America's multi-state, multi-unit restaurant and foodservice chains. We employ almost 2 million people in more than 90,000 restaurants nationwide. McDonald's, Burger King, Wendy's, Taco Bell and all our members appreciate Congressman Waxman's smoke-free initiative because it treats all businesses equally under the law - the only legislation to do so.

The National Council of Chain Restaurants is traditionally not a big fan of federal mandates. However, our industry recognizes the ever growing public demand for smokers to refrain from smoking while they are in a public facility. The Smoke-Free Environment Act of 1993 is the only way to resolve this issue fairly. This bill makes no distinctions between different types of public facilities, and no one group or industry is singled out and treated differently.

I say that because, frankly, we have been concerned by all of the attention focused on chain restaurants. We have always striven to provide a wholesome and pleasing environment for all our customers. But for us to guarantee a 100% smoke-free environment is not possible in today's business climate for two important reasons:

First, we are in a very competitive business. Any company that unilaterally implemented smoke-free policies will risk being at a competitive disadvantage. Second, we operate through thousands of franchisees. These franchisees are independent businesses. Our members simply don't have the legal authority to dictate smoking policies to their franchisees.

But, where the customers have been demanding smoke-free facilities, we have responded. Right now, there are approximately 30,000 of our restaurants that are smoke-free. Carl Karcher, one of our California-based companies, implemented a smoke-free policy in all company-owned restaurants several years ago. And you have all heard that McDonald's has implemented smoke-free policies in all company-owned stores.

But the Smoke-Free Environment Act would remove all of the impediments for all of the companies to go smoke free. It simply provides the level playing field that our industry needs to reach the 100% mark

We want to thank Congressman Waxman for agreeing to make several important changes to the legislation that were essential to our decision to support the bill. We were very concerned that any legislation we supported have effective safeguards to deter frivolous and unnecessary lawsuits against public facilities. Congressman Waxman shared our concerns and has agreed to several specific changes in the statutory language that will –

** require that 60 days advance written notice of an alleged violation be given prior to the filing of a lawsuit, and bar lawsuits where public facilities come into compliance within the notice period;

** prohibit compensatory or punitive damages from being awarded in lawsuits brought under this law;

** provide that courts with the discretion to award costs of litigation and attorneys fees to any prevailing party, including the public facility, in lawsuits brought under this law and;

** clarify that violations of the smoking prohibition by an individual within a public facility will not be considered violations of the law by the public facility, if they are isolated incidents that are not part of a pattern of violations, and are not authorized by the public facility.

These modifications significantly enhance the legislation; and these changes, together with the fact that the law would provide a truly level playing field for all public facilities, are why the National Council of Chain Restaurants is supporting this bill. We appreciate very much that Congressman Waxman shares our concerns, and has worked with us to improve the legislation. The National Council of Chain Restaurants commits to work hard to support the enactment of the Smoke-Free Environment Act of 1993.



National Medical Association

1012 Tenth Street, Northwest
Washington, D.C. 20001-4492
(202) 347-1895 FAX (202) 842-3293

March 17, 1994

Subcommittee on Health and the Environment
Committee on Energy and Commerce
United States House of Representatives
512 House Annex One
300 New Jersey Avenue, S.E.
Washington, D.C. 20515

Dear Congressman Waxman:

The National Medical Association, which represents the nation's 20,000 plus African American physicians, is pleased to support the Smoke Free Environment Act of 1993 (HR 3434).

The Association is not only well aware of the health hazards associated with second-hand smoke, but has also long advocated smoke-free work environments where employees can perform to their fullest potential without the health risk, inconvenience, or to many the annoyance of inhaling tobacco smoke. The National Medical Association is a smoke-free building.

We are pleased to see that so many others, including our current and past Surgeon Generals, have taken a stand on this issue. It is imperative that the interests of the public be protected. The medical evidence is overwhelming, smoking in public places presents a present and imminent danger to those placed in that environment.

Again, the National Medical Association gives its endorsement of HR 3434 and will continue to advocate smoke-free environments through our constituency and our patients.

Sincerely yours,

Leonard E. Lawrence, M.D.
Leonard E. Lawrence
President
National Medical Association

Excellence in Medicine: 100 Years of Caring

**RESTAURANT
ASSOCIATION OF
MARYLAND**

March 14, 1994

Honorable Henry A. Waxman
Chairman, Subcommittee on Health and the Environment
2415 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Waxman:

The Restaurant Association of Maryland (RAM) would like to express our support of H.R. 3434, The Smoke-Free Environment Act of 1993.

We support this bill because it is the best proposal yet to address this issue at the national level, but we would ultimately prefer if the bill was still further definitive in its prohibition of smoking in workplaces.

H.R. 3434 does, however, make great strides in addressing the serious issue of exposure to environmental tobacco smoke (ETS) in the workplace. We believe that once it was determined that second-hand smoke is a Class A carcinogen, that every employee's health needs should be addressed and, therefore, a ban on smoking should include all workplaces.

Your efforts and the efforts of the committee are very admirable in this regard and we urge support of this well-intended initiative.

Sincerely,



Paula Kreuzburg
President
Restaurant Association of Maryland

The Restaurant Association of Maryland Building
7113 Anhabassador Road • Baltimore, Maryland 21244-2727 • 410-298-0011 • 800-874-1313 (in MD)
FAX 410-298-0299

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Special Issue

Revised July 12, 1994

Summary of the Smoke-Free Environment Act (H.R. 3434)

The Dangers of ETS Exposure. Environmental tobacco smoke -- the second-hand cigarette smoke breathed by nonsmokers -- is a known human lung carcinogen. According to the American Medical Association, ETS is the nation's third leading cause of premature death, killing over 50,000 Americans each year through cancer and heart disease. Children are at special risk, because each year ETS exposure causes 150,000 to 300,000 cases of bronchitis and pneumonia in infants and young children and triggers and exacerbates asthma attacks in 200,000 to 1,000,000 children.

Summary of Major Provisions. The Smoke-Free Environment Act (H.R. 3434) protects the public from involuntary exposure to ETS. Five former Surgeons General describe as H.R. 3434 "the most important legislation in disease prevention in years," achieving "enormous savings in human life and illness at minimal cost."

Specifically, H.R. 3434 requires the "responsible entity" (the owner or lessee) of "public facilities" (nonresidential buildings regularly entered by ten or more persons) to provide a smoke-free environment to building occupants. To do this, the responsible entity may either (1) ban smoking inside the building or (2) restrict smoking to designated rooms that are separately exhausted to prevent the recirculation of ETS. The requirements of H.R. 3434 are enforced through citizen suits, avoiding the creation of a new federal bureaucracy.

Subcommittee Markup. H.R. 3434 was reported by the Health and the Environment Subcommittee on May 12, 1994, by a vote of 14 to 11. An amendment adopted by the Subcommittee clarified that an "isolated incident" of smoking in a public facility does not violate the Act; rather, there must be a "pattern of violations" before enforcement action can be taken.

Other amendments exempted private clubs, tobacco shops, bars, restaurants, and prisons from the Act. Some of these exemptions -- in particular the exemptions for restaurants and prisons -- are likely to be revisited during the legislative process.

Costs and Benefits. An EPA analysis concludes that the benefits of H.R. 3434 far outweigh its costs. According to EPA's analysis, compliance with H.R. 3434 will cost less than \$1.5 billion a year. For this investment, each year the nation will:

- * Save 7,000 to 13,000 lives of nonsmokers, valued conservatively at \$33 to \$60 billion.
- * Save 34,000 to 67,000 lives of smokers who quit smoking or reduce their cigarette consumption.
- * Avoid hundreds of thousands of childhood illnesses, producing a savings of \$2 to \$5 billion.
- * Save \$4 billion to \$8 billion in building maintenance expenses.

ETS Facts
Special Issue
Page Two

Endorsements. H.R. 3434 has been endorsed by a broad coalition of health experts, business organizations, and government agencies and officials, including the following:

Health Organizations

American Medical Association
American Lung Association
American Heart Association
American Cancer Society
American College of Chest Physicians
American Academy of Pediatrics
American Academy of Otolaryngology

American Public Health Association
American Industrial Hygiene Association
American Ass'n of Occupational Health Nurses
American College of Occupational and
Environmental Medicine
National Medical Association
Texas Medical Association

Business Organizations

Building Owners and Managers Association
National Realty Committee
National Council of Chain Restaurants
California Restaurant Association
Maryland Restaurant Association
American Council of Life Insurance
Health Insurance Association of America
American Institute of Architects

McDonald's Corporation
Arby's Inc.
General Nutrition Centers
Merck & Co.
Southern California Edison Co.
Rouse Company
Taubman Company

Government Agencies and Officials

Environmental Protection Agency
U.S. Surgeon General
Ass'n of State and Territorial Health Officials
National Association of County Health Officials
Michigan Department of Health
Pennsylvania Department of Health
Texas Department of Health

22 State Attorneys General (Arizona, Connecticut, Florida, Hawaii, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, New Mexico, New York, Oklahoma, Rhode Island, Texas, Utah, and Washington)

Other Organizations and Individuals

National Fire Protection Association
International Association of Fire Chiefs
National Parents and Teachers Association
National Child Care Association
Coalition for Consumer Health and Safety
Sierra Club

Association of Flight Attendants
Federal Employees for Smoke-Free Workplace
Action on Smoking and Health
Americans for Nonsmoker Rights
U.S. Public Interest Research Group
Public Citizen

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 1

January 31, 1994

Introduction to Environmental Tobacco Smoke

This issue of ETS Facts is the first in a series of fact sheets on environmental tobacco smoke (ETS). It answers some basic questions about ETS, such as what it is and how many people are exposed. Future issues of ETS Facts will address the health effects caused by exposure to ETS and the benefits and costs of protecting the public from exposure to ETS.

What Is ETS? Environmental tobacco smoke is a mixture of "sidestream smoke" given off from smoldering cigarettes and "mainstream smoke" exhaled from the smoker. Sidestream smoke makes up 85% of ETS, mainstream smoke 15%.

Over 4,000 chemical compounds have been identified in ETS, including over 40 known or suspected human carcinogens.

How Does ETS Compare to the Smoke Inhaled by Smokers? ETS is actually more toxic than the mainstream smoke inhaled by smokers. Because sidestream smoke burns at a lower temperature than mainstream smoke (600°C vs. 800-900°C) and because sidestream smoke is unfiltered, sidestream smoke contains more pollutants per unit of tobacco combusted than mainstream smoke.

All of the five known human carcinogens in tobacco smoke for which data is available (benzene, 2-naphthylamine, 4-aminobiphenyl, nickel, and polonium-210) are present at higher quantities in sidestream smoke than mainstream smoke; some are more than 30 times more concentrated in sidestream smoke than mainstream smoke. Similarly, there is more than twice the carbon monoxide (a gas that diminishes the ability of blood to carry oxygen) and more than three times the ammonia (an eye and respiratory irritant) in sidestream smoke than mainstream smoke.

Who Is Exposed to ETS? 46 million smokers in the U.S. consume 500 billion cigarettes each year, burning over 800 million pounds of tobacco. The result is that virtually everyone is exposed to ETS. Tests of blood, saliva, and urine show that as many as three out of four nonsmokers have been recently exposed to ETS.

ETS exposure is widespread in homes (over 40% of children age 5 and under live in households with current smokers), work places (40% of adults work in locations where smoking is allowed), and public places. ETS levels in the average restaurant are 50% higher than in homes occupied by a smoker.

What Impact Does ETS Have on Indoor Air Quality? Americans have become increasingly concerned about the quality of indoor air, where they spend 90% of their time. ETS is the largest single source of pollution in this air. ETS causes over 80% of the particulate pollution in buildings that allow smoking.

Pollution levels indoors often exceed federal health standards for outdoor air due to the presence of ETS. In an unventilated room, a single cigarette can raise particulate levels to over 500 micrograms per cubic meter (ug/m³) -- over three times the short-term ambient air quality standard set by EPA (150 ug/m³). In a typical restaurant that allows smoking (with an average number of smokers smoking an average number of cigarettes and recommended levels of ventilation), particulate levels will violate the federal health standard by 33%.

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 2

February 10, 1994

The Risks of ETS Exposure for Adults

This issue of ETS Facts examines one important aspect of the public health threat caused by environmental tobacco smoke: the effects of ETS on adults. The next issue of ETS Facts will examine the effects of ETS on children.

Number of Fatalities Caused by ETS Exposure. According to the American Medical Association, exposure to ETS is the third leading cause of premature death in the country, responsible for over 50,000 fatalities each year. Only direct smoking (419,000 deaths) and alcohol (105,000 deaths) cause more deaths than ETS.

Lung Cancer Deaths. An abundant body of evidence establishes that ETS is a cause of lung cancer:

- In 1986, the Surgeon General concluded: "A clear judgment can now be made: exposure to ETS is a cause of lung cancer."
- In 1986, the National Academy of Sciences concluded: "Considering the evidence as a whole, exposure to ETS increases the incidence of lung cancer in nonsmokers."
- In 1991, the National Institute of Occupational Safety and Health concluded: "the collective weight of evidence ... is sufficient to conclude that ETS poses an increased risk of lung cancer."

In January 1993, EPA classified ETS as a "known human carcinogen" and estimated that ETS causes 3,000 lung cancer deaths in the U.S. each year. The majority of these deaths (over 70%) are due to exposures that occur outside the home.

Compared to other cancer risks regulated by EPA, the risks of ETS exposure are extraordinarily high. EPA often regulates pollutants when the lifetime risk of cancer exceeds 1 in 1 million. In the case of ETS, the lifetime lung cancer risk for a person who spends 8 hours a day in a building without smoking restrictions is 1 in 400 -- a risk 2,500 times higher than 1 in 1 million.

Heart Disease Deaths. The American Heart Association has concluded that ETS is "a major preventable cause of cardiovascular disease and death," causing about 37,000 to 40,000 deaths from heart disease each year. The American Heart Association estimates that the risk of death from heart disease is increased by 30% among those exposed to ETS at home and "could be much higher" in those exposed in the workplace, where higher levels of ETS may be present.

Other (Nonlung) Cancer Deaths. Studies find that nonsmokers exposed to ETS have a higher risk of dying from cancers other than lung cancer than the truly unexposed. According to the American Medical Association, ETS is estimated to cause 12,000 deaths each year from these nonlung cancers.

Other Adverse Health Effects. In addition to causing death, ETS causes coughing, chest discomfort, and phlegm production in adults, and reduces lung capacity. In fact, persons regularly exposed to ETS suffer effects on lung function that are comparable to "light smoking," which is defined as smoking fewer than 10 cigarettes per day. According to the Centers for Disease Control, 80% of nonsmokers are annoyed by ETS exposure. And nearly 5 million adults experience "great discomfort" from ETS exposure.

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 3

March 3, 1994

The Risks of ETS Exposure for Children

Children are the population most vulnerable to exposure to environmental tobacco smoke (ETS). According to EPA, it is possible that even brief exposure to ETS at a highly susceptible age may affect a child's lungs. This issue of ETS Facts summarizes the risks of ETS exposure for children.

Childhood Exposure to ETS. Millions of American children are exposed to ETS at home. According to EPA, over 40% of children age 5 and younger (over 7 million children) live in a household with at least one smoker.

Exposure outside the home can also be a significant risk to children. For many children, exposure to ETS from nonfamily members can be as much as one third of the exposure caused by a smoking parent. EPA has estimated that due to "background" levels of ETS outside the home, even children of nonsmoking parents may have twice the risk of developing illness compared to truly unexposed children. According to the Surgeon General, nearly 800,000 children in the U.S. are exposed to ETS in childcare centers or schools.

As described below, these exposures to ETS in childhood cause a long list of health effects, including asthma attacks, lower respiratory tract infections like pneumonia and bronchitis, and middle ear effusion. Even before birth, ETS exposure is a potentially serious health risk.

Asthma Attacks. There are 2 to 5 million children with asthma in the United States. For 20% of these children (400,000 to 1 million children), ETS exposure can trigger or worsen the severity of an asthma attack. For 10% of these children (200,000 to 500,000 children), exposure to ETS is a major aggravating factor.

In fact, according to the American Lung Association, ETS exposure triggers 23 asthma attacks in American children every hour.

ETS is also a "risk factor" in the onset of asthma. EPA estimates that exposure to ETS may cause 8,000 to 26,000 new cases of childhood asthma each year.

Pneumonia and Bronchitis. In 1986, the Surgeon General concluded that children exposed to ETS have "an increased frequency of respiratory infections" such as pneumonia and bronchitis. The National Academy of Sciences also reached the same conclusion in 1986, reporting that the incidence of pneumonia and bronchitis is "significantly increased" in infants of smoking parents.

EPA confirmed these findings in its 1993 report on ETS, concluding that ETS exposure causes 150,000 to 300,000 cases of bronchitis, pneumonia, and other lower respiratory tract infections each year in children under 18 months of age. In 5% of these cases (7,500 to 15,000 cases), the infection is so severe that hospitalization is required.

The effects of these early lung infections can last a lifetime. Early respiratory illness can lead to permanently reduced lung function and chronic obstructive lung disease such as emphysema.

Middle Ear Effusion. ETS exposure in children irritates the eustachian tube, which connects the nose to the middle ear. This causes swelling and obstruction of the tube, which leads to the buildup of fluid ("middle ear effusion"), pain, and infection in the middle ear.

The increased prevalence of middle ear effusion has "very important public health consequences," according to EPA. Middle ear effusion is the most common reason for hospitalization of young children and may result in long-term detriments in linguistic and cognitive development.

Fetal Injury. According to a study published in February in the Journal of the American Medical Association (JAMA), maternal exposure to ETS affects the mother's fetus. The study found significantly elevated levels of cotinine (a metabolite of nicotine) in the hair of newborn infants whose mothers were regularly exposed to ETS. The cotinine levels in these infants were double the levels in infants of unexposed mothers and one fourth the levels in infants of smoking mothers.

Other studies have shown that exposure to ETS during pregnancy reduces the birth weight of infants and may cause subtle problems with speech, language, and attention span.

Other Significant Health Effects. ETS exposure also causes many other significant adverse health effects in children:

- EPA, the Surgeon General, and the National Academy of Sciences have concluded that ETS causes respiratory irritation in children, including cough, wheezing, and sputum production.
- EPA and the Surgeon General have found that ETS exposure reduces lung function in children.
- The Surgeon General has estimated that 700 infants die each year from sudden infant death syndrome (SIDS) as a result of maternal smoking. According to the Surgeon General, infants whose mothers smoke are two to three times more likely to die from SIDS than infants of nonsmoking mothers.

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 4

Revised July 12, 1994

Surgeons General Support H.R. 3434

On February 7, 1994, the current and five former Surgeons General -- representing 25 years of consecutive service to the last six Administrations -- testified before the Health and the Environment Subcommittee on the Smoke-Free Environment Act of 1993 (H.R. 3434).

Each of the Surgeons General endorsed H.R. 3434. And each agreed that "an overwhelming preponderance of scientific evidence favors the legislation." Subsequently, on March 21, the five former Surgeons General wrote the following letter to members of the Health and the Environment Subcommittee:

"We are the former Surgeons General for the past 25 years. Last month, we testified before the Subcommittee on Health and the Environment in strong support of H.R. 3434, the Smoke-Free Environment Act. We are writing now to reiterate the vital importance of H.R. 3434.

"H.R. 3434 is the most important legislation in disease prevention in years. According to the Environmental Protection Agency, enactment of H.R. 3434 would save 38,000 to 108,000 lives each year. It would also avoid countless incidents of respiratory illness and asthma attacks in children. This is an enormous savings in human life and illness -- and under H.R. 3434, it would be achieved at minimal cost and with minimal bureaucratic involvement.

"An overwhelming body of scientific evidence proves that environmental tobacco smoke (ETS) poses a significant health risk for adults, children, and even the unborn. Many studies have shown that ETS is deadly. In fact, ETS is estimated to kill over 50,000 Americans each year, making ETS the third leading cause of premature death in the United States.

"Because of their inability to avoid exposure and their special sensitivities, ETS is a particular risk to children, each year triggering hundreds of thousands of cases of bronchitis, pneumonia, and other respiratory diseases. As many as a million children suffer asthma attacks after exposure to ETS.

"Passage of H.R. 3434 would benefit all Americans. The health of nonsmokers, especially children, would improve. Smokers would find it easier to quit. Many teenagers would never take up smoking if there is no place to light up. And businesses would reduce their cleaning costs.

"Because of the critical role this bill would have in preventing disease, reducing health care costs, and strengthening our economy, we ask that you support H.R. 3434. Sincerely,

"Antonia C. Novello, M.D. Surgeon General (1990-1993)	C. Everett Koop, M.D. Surgeon General (1981-1989)	Julius B. Richmond, M.D. Surgeon General (1977-1981)
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"S. Paul Ehrlich, Jr., M.D. Surgeon General (1973-1977)	Jesse L. Steinfeld, M.D. Surgeon General (1969-73)"
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ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 5

July 22, 1994

The Tobacco Industry's Misinformation Campaign

On February 11, 1993, a front-page article in the Wall Street Journal described the tobacco industry's efforts to refute the adverse health effects of smoking as "the longest running misinformation campaign in U.S. business history."

The tobacco industry has now adopted a similar tactic to counter public concern about the dangers of environmental tobacco smoke (ETS), the second-hand cigarette smoke breathed by nonsmokers. In a series of full-page advertisements in the country's major newspapers, the two largest tobacco companies -- Philip Morris and R.J. Reynolds -- deliberately distort the record of the serious public health threats from ETS.

The main target of the industry's ads is the U.S. Environmental Protection Agency's report on the respiratory health effects of passive smoking. The 530-page EPA report concludes that ETS causes lung cancer in adults and severe respiratory illnesses in children. The report was begun by the Reagan Administration, released by the Bush Administration, and endorsed by the Clinton Administration.

As documented in the EPA report and many other studies, there is extensive scientific data about the harmful effects of ETS. This issue of ETS Facts compares the tobacco industry's claims about ETS with the real scientific data.

Claim: "The EPA's announcement in 1993 that exposure to secondhand smoke causes lung cancer has fueled this debate. After reviewing the EPA report and process in some detail some scientists and commentators have concluded that the data do not justify EPA's conclusion. ... The secondhand smoke issue is not yet resolved." New York Times, R.J. Reynolds Tobacco Co. Advertisement, May 26, 1994

Facts: The objective of the tobacco company advertisements is to create doubt and the illusion of a scientific controversy, where in fact none exists. In addition to EPA, both the National Academy of Sciences and the U.S. Surgeon General have independently concluded that ETS causes lung cancer. Moreover, since the release of EPA's report, every independent medical organization that has examined the report has agreed that ETS causes lung cancer. These organizations include:

National Cancer Institute
American Medical Association
American Lung Association
American Cancer Society
American Heart Association
American Academy of Pediatrics
American Academy of Otolaryngology
American College of Chest Physicians

American Industrial Hygiene Association
American Association of Occupational and
Environmental Medicine
National Medical Association
Ass'n of State and Territorial Health Officials
National Association of County Health Officials
National Cancer Advisory Board
American Public Health Association

Even the tobacco industry's own independent experts agree that ETS causes lung cancer. Recently, the Health and the Environment Subcommittee polled the members of the Science Advisory Board of the Center for Indoor Air Research. This Center was established in 1988 by Philip Morris, R.J. Reynolds, and other tobacco companies to study issues relating to indoor air quality, including ETS. Its Science Advisory

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Board consists of indoor air experts picked by the tobacco companies for their "reputations for expertise and scientific leadership."

Seven of the nine-member Science Advisory Board responded to the Subcommittee's poll. Five members agreed with the statement that "environmental tobacco smoke is a human lung carcinogen," compared with only one member who disagreed (one member expressed no opinion). Six members agreed with the statement that "ETS present a serious and substantial public health threat to children." These views from the industry's own science advisors directly contradict the position espoused in the industry's media campaign.

Virtually the only scientists who support the industry's contentions are scientists with financial ties to the tobacco industry. Alvan Feinstein, who is frequently cited by the tobacco industry, has received over \$500,000 dollars in grants from the tobacco industry. Gary Huber, another frequently cited scientist, has been a consultant for lawyers representing tobacco companies since 1986. At the time he wrote the article reprinted in the Philip Morris ads, Jacob Sullum was the managing editor of Reason Magazine, which receives major donations from Philip Morris and its subsidiary Kraft General Foods.

Claim: "Out of 30 studies used by the EPA, not one showed a strong statistical link between secondhand smoke and lung cancer in non-smokers." New York Times, Philip Morris Inc. Advertisement, June 28, 1994

Facts: The tobacco industry uses a divide-and-conquer tactic to attack the epidemiological evidence relied upon by EPA, focussing on perceived flaws in individual studies while ignoring the weight of the studies taken together. But it is the combined evidence that is most important -- and this evidence is very strong. Of the 30 epidemiologic studies from 8 countries analyzed in the EPA report, 24 (80%) show a positive association between ETS and lung cancer. As EPA calculated, the possibility that chance could explain this result is extremely low -- less than 1 in 1,000.

The link between ETS exposure and lung cancer becomes a virtual certainty when one examines the results of the 17 most detailed studies. These studies correlated lung cancer risks with the actual level of exposure to ETS experienced by the women evaluated in the studies. All 17 of these studies show increased cancer risks in the highest exposure group, with 9 being statistically significant. The probability of these results occurring by chance is less than 1 in 10 million.

Claim: "Of 11 U.S. studies used by the EPA, not a single one concluded that there is a statistically significant overall association between secondhand smoke and lung cancer." New York Times, Philip Morris Inc. Advertisement, June 29, 1994

Facts: This statement wrongly implies that the U.S. studies do not support EPA's conclusion, when in fact they provide strong support. It is not surprising that many of the U.S. studies -- viewed individually -- did not find statistically significant results in what the tobacco industry misleadingly calls the "overall" analysis. In the first place, many of the U.S. studies were small. Seven of the U.S. studies analyzed fewer than 45 lung cancer cases, giving them limited "power" to identify true increases in risk with 95% certainty, the measure of statistical significance.

A more fundamental problem with the industry's claim is its focus on the so-called "overall" association. In this analysis, the 11 U.S. studies compared lung cancer rates among women classified either as (1) "ever" exposed to ETS from a husband who smoked or as (2) "never" exposed to ETS from a husband who smoked. This ever-versus-never analysis is a relatively inaccurate measure of actual exposure to ETS. For example, a woman who lived with a smoking husband for a short period but who had no workplace

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exposure to ETS would be classified as "ever" exposed, while a woman who did not live with a smoking husband but who had intensive workplace exposure to ETS for a long period would be classified as "never" exposed. This classification of the minimally exposed woman as "ever" exposed and the heavily exposed woman as "never" exposed would have the effect of masking the true dangers of ETS in the ever-versus-never analysis.

To overcome this defect in the ever-versus-never analysis and provide a truer test of the effects of ETS, seven of the U.S. studies correlated lung cancer risks with the level of the woman's exposure. All seven of these studies found increased risks of lung cancer for the most heavily exposed women, including two that were statistically significant (i.e., 95% certain). These consistent, statistically significant results in the exposure-level analysis provide convincing confirmation of EPA's findings.

Claim: "A large U.S. study, published in the American Journal of Public Health, found no overall statistically significant link between secondhand smoke and lung cancer. Why did the EPA not include this study?" New York Times, Philip Morris Inc. Advertisement, July 3, 1994

Facts: The study referred to by the tobacco industry (Brownson et al, "Passive Smoking and Lung Cancer in Nonsmoking Women," Am. J. of Public Health, Nov. 1992) supports EPA's finding, but was not included in the EPA report because it was published after the cutoff date for literature review. In the important analysis based on exposure levels, the Brownson study found a statistically significant positive association between high-level exposure to ETS and lung cancer. As a result of these findings, the Brownson study concluded as follows (emphasis added):

In summary, our study and others conducted during the past decade suggest a small but consistent elevation in the risk of lung cancer in nonsmokers due to passive smoking. The proliferation of federal, state, and local regulations that restrict smoking in public places and work sites is well founded.

Two other U.S. studies funded by the National Cancer Institute have also been completed since the publication of the EPA report (the Stockwell study and the Fontham study). Both of these studies also find statistically significant relationships between ETS and lung cancer. The Fontham study, the largest and best-designed study to date, found statistically significant risks not only for spouses exposed at home but also for women exposed to ETS in the workplace and in social settings. The study also found that childhood exposures to ETS increased lung cancer risks.

Claim: "The EPA manipulated science to serve a political cause. ... The EPA abandoned generally accepted scientific methods." New York Times, Philip Morris Inc. Advertisement, June 29, 1994

Facts: The tobacco industry claims that EPA manipulated science because the agency used a "one-tailed test of significance" instead of a "two-tailed test of significance" in setting the "confidence interval" in a "meta-analysis" used in determining the extent of the lung cancer risk. This is a virtually meaningless technical debate that has no bearing on the classification of ETS as a human lung carcinogen. Moreover, this objection (and the others raised by the tobacco industry) were reviewed and rejected by a panel of 18 independent experts assigned to peer-review the EPA report. These independent experts approved the EPA methodology and unanimously endorsed the conclusion that ETS is a human lung carcinogen.

Claim: "With all the discussion today about secondhand smoke, you may be interested in how much you are exposed to. The answer, in our opinion is very little. Expressing exposure to secondhand smoke in terms of cigarette equivalents is one way to gain perspective. For example, in a month, a non-smoker living

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with a smoker would, on average, be exposed to secondhand smoke equivalent to smoking approximately 1 1/2 cigarettes." New York Times, R.J. Reynolds Tobacco Co. Advertisement, May 23, 1994

Facts: There is a fundamental problem with a cigarette-equivalent analysis used by R.J. Reynolds. The results depend heavily on which of the thousands of components of cigarette smoke is analyzed. For this reason, the U.S. Surgeon General has dismissed the cigarette equivalence concept as "misleading" and "potentially meaningless."

In this case, R.J.R. used exposure to nicotine, which dissipates rapidly from the atmosphere, as the basis for calculating cigarette equivalence. As a result, R.J.R. reported an extremely low cigarette equivalence. On the other extreme, if R.J.R. had used exposure to ammonia to calculate cigarette equivalence, it would have reached a completely different result -- a cigarette equivalence of more than 50 cigarettes per day.

The tobacco industry's own Center for Indoor Air Research has recognized that the use of nicotine to determine cigarette equivalence is misleading. In a 1992 publication, The Chemistry of Environmental Tobacco Smoke, the Center reported that "because nicotine is so rapidly depleted from the air relative to other ETS constituents, using nicotine as a marker may seriously underestimate exposure to these other species."

Claim: "The public never got the full story about the EPA report." New York Times, Philip Morris Inc. Advertisement, July 3, 1994

Facts: This is an ironic criticism. One of the most important conclusions in the EPA report is the finding that ETS presents a "serious and substantial" threat to children. Specifically, EPA found that ETS produces severe respiratory problems for children, including causing 150,000 to 300,000 cases of bronchitis and pneumonia each year and exacerbating asthma in up to one million children. Yet the tobacco industry studiously avoids mentioning these findings. Its strategy is to portray the EPA report as exclusively addressing lung cancer -- and then to raise fallacious doubts about the proven link between ETS and lung cancer.

ETS FACTS

*Prepared by the Majority Staff, Subcommittee on Health and the Environment,
Committee on Energy and Commerce, U.S. House of Representatives*

Issue 6

August 2, 1994

Cost-Benefit Analysis of H.R. 3434

In April, the Environmental Protection Agency released a cost-benefit analysis of the Smoke-Free Environment Act (H.R. 3434). The analysis concluded that the annual benefits of H.R. 3434 (\$39.5 to \$73.8 billion) far outweigh its costs (\$0.5 to \$1.4 billion). This issue of ETS Facts summarizes EPA's cost-benefit analysis.

Costs of Compliance. H.R. 3434 requires the owners of nonresidential buildings to provide a smoke-free environment by either banning smoking within the building or restricting smoking to separately exhausted smoking lounges. If all building owners simply banned smoking (the lowest cost method of compliance), the national cost would be just \$100 million to \$400 million each year. If 10% to 20% of building owners elected to provide smoking lounges (the most likely scenario), the cost would rise to \$0.5 to \$1.4 billion per year. 23% of nonresidential buildings are already in compliance.

Lives Saved. Enactment of H.R. 3434 would virtually eliminate exposure to environmental tobacco smoke (ETS) outside the home. EPA estimates that this would save the lives of 7,000 to 13,000 nonsmokers each year. At a conservative value of \$4.8 million per life, the annual value of these lives saved is \$33 to \$60 billion.

EPA also estimates that enactment of H.R. 3434 would (1) cause 3% to 6% of current smokers to stop smoking, (2) reduce national cigarette consumption by 10% to 15%, and (3) reduce the number of teenagers who start smoking by 5% to 10% each year. These effects would save 27,000 to 54,000 lives of smokers each year for the next 50 years. Thereafter, when the benefits of reduced initiation begin to be realized, even more lives (47,000 to 92,000 each year) would be saved. To be conservative, EPA did not estimate the value of these savings in life.

In total, passage of H.R. 3434 would save 34,000 to 67,000 lives per year for 50 years and 54,000 to 105,000 lives per year thereafter.

Childhood Illnesses Avoided. Another major health benefit of H.R. 3434 would be a reduction in childhood illnesses. EPA estimates that exposure to ETS outside the home causes 15,000 to 30,000 cases of pneumonia or bronchitis in children each year, exacerbates asthma in 100,000 to 300,000 children, and sends millions of children to the doctor's office for cough and ear infections. Virtually all of these illnesses would be eliminated under H.R. 3434, producing an economic saving of \$2 to \$5 billion per year.

Savings in Building Maintenance and Fire Expenses. The reduction in cigarette smoke and ashes caused by H.R. 3434 would cut cleaning and maintenance costs by 10% in many buildings, producing an economic saving of \$4 to \$8 billion per year. In addition, H.R. 3434 would virtually eliminate smoking-related fires in nonresidential buildings, producing an economic savings of \$0.5 to \$0.7 billion each year.

Total Net Benefits. In total, passage of H.R. 3434 would produce net benefits of \$39 to \$72 billion per year. These benefits are more than 50 times greater than the costs of the legislation.

H.R. 3434

[Showing amendments adopted in subcommittee]

Strike out all after the enacting clause and insert:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Smoke-Free Environment Act of 1994".

SEC. 2. SMOKE-FREE ENVIRONMENT POLICY.

The Public Health Service Act is amended by adding the following new title at the end thereof:

"TITLE XXVII--SMOKE-FREE ENVIRONMENTS**"SEC. 2701. SMOKE-FREE ENVIRONMENT POLICY.**

"(a) Policy Required.--In order to protect children and adults from cancer, respiratory disease, heart disease, and other adverse health effects from breathing environmental tobacco smoke, the responsible entity for each public facility shall adopt and implement at such facility a smoke-free environment policy which meets the requirements of subsection (b).

"(b) Elements of Policy.--Each smoke-free environment policy for a public facility shall--

"(1) prohibit the smoking of cigaretes, cigars, and pipes, and any other combustion of tobacco, within the facility and on facility property within the immediate vicinity of the entrance to the facility; and

"(2) post a clear and prominent notice of the smoking prohibition in appropriate and visible locations at the public facility.

The policy may provide an exception to the prohibition specified in paragraph (1) for one or more specially designated smoking areas within a public facility if such area or areas meet the requirements of subsection (c).

"(c) Specially Designated Smoking Areas.--A specially designated smoking area meets the requirements of this subsection if:

"(1) the area is ventilated in accordance with specifications promulgated by the Administrator that insure that air from the area is directly exhausted to the outside and does not recirculate or drift to other areas within the public facility;

"(2) nonsmoking individuals do not have to enter the area for any purpose; and

"(3) children under the age of 15 are prohibited from entering the area.

"SEC. 2702. CITIZEN ACTIONS.

"(a) In General.--An action may be brought to enforce the requirements of this title by any aggrieved person, any State or local government agency, or the Administrator.

"(b) Venue and Penalty.--Any action to enforce this title may be brought in any United States district court for the district in which the defendant resides or is doing business to enjoin any violation of this title or to impose a civil penalty for any such violation in the amount of not more than \$5,000 per day of violation. The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce this title and to impose civil penalties under this title.

"(c) Notice.--An aggrieved person shall give any alleged violator written notice of at least 60 days prior to commencing an action under this section. No action may be commenced by an aggrieved person under this section if such alleged violator complies with the requirements of this

title within such 60-day period and thereafter.

“(d) Costs.--The court, in issuing any final order in any action brought pursuant to this section, may award costs of litigation (including reasonable attorney and expert witness fees) to any prevailing party, whenever the court determines such award is appropriate.

“(e) Use of Penalties.--The court in any action under this section to apply civil penalties shall have discretion to order that such civil penalties be used for projects which further the policies of this title. The court shall obtain the view of the Administrator in exercising such discretion and selecting any such projects.

“(f) Damages.--No damages of any kind, whether compensatory or punitive, shall be awarded in actions brought pursuant to this title.

“(g) Isolated Incidents.--Violations of the prohibition specified in section 2701(b)(1) by an individual within a public facility or on facility property shall not be considered violations of this title on the part of the responsible entity if such violations:

- “(1) are isolated incidents that are not part of a pattern of violations of such prohibition; and
- “(2) are not authorized by the responsible entity.

“SEC. 2703. PREEMPTION.

“Nothing in this title shall preempt or otherwise affect any other Federal, State or local law which provides protection from health hazards from environmental tobacco smoke.

“SEC. 2704. REGULATIONS.

“The Administrator is authorized to promulgate such regulations as the Administrator deems necessary to carry out this title.

“SEC. 2705. EFFECTIVE DATE.

“The requirements of this title shall take effect on the date one year after the date of the enactment of the Smoke-Free Environment Act of 1994.

“SEC. 2706. DEFINITIONS.

“As used in this title--

“(1) Administrator.--The term ‘Administrator’ means the Administrator of the Environmental Protection Agency.

“(2) Public Facility.--The term ‘public facility’ means any building regularly entered by 10 or more individuals at least one day per week, including any such building owned by or leased to a Federal, State, or local government entity. Such term shall not include any building or portion thereof regularly used for residential purposes. Such term shall also not include--

“(A) any private club while in use for social or fraternal activities that are not open to the public;

“(B) any commercial establishment engaged primarily in the sale of tobacco and tobacco-related products;

“(C) any commercial establishment engaged primarily in the sale of alcoholic beverages or food for consumption on the premises; or

“(D) jails or prisons.

“(3) Responsible Entity.--The term ‘responsible entity’ means, with respect to any public facility, the owner of such facility, except that in the case of any such facility or portion thereof which is leased, such term means the lessee.”.



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